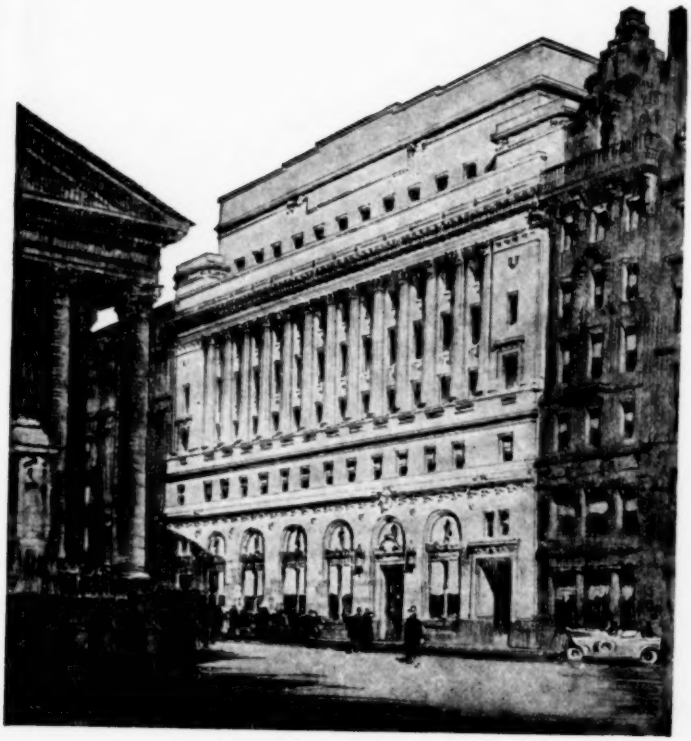
332.105
LL
LIBRARY
UNIVERSITY OF
WASHINGTON



Lloyds Bank Review

1677

JANUARY 1952

Lloyds Bank Limited

Head Office: 71 LOMBARD STREET, LONDON, E.C.3

Chairman
THE RT. HON. LORD BALFOUR OF BURLEIGH, D.C.L., D.L.

Vice-Chairmen
R. A. WILSON HARALD PEAKE
SIR JEREMY RAISMAN, G.C.I.E., K.C.S.I.

Chief General Manager
A. H. ENSOR

Deputy Chief General Managers
R. G. SMERDON, M.C. E. J. HILL

Joint General Managers
R. T. FAGAN, D.F.C. A. J. FAUX
F. O. FAULL G. Y. HINWOOD

Assistant General Managers
R. F. E. WHITTAKER, C.B., C.B.E. (Administration)
D. H. TURNER (Executor & Trustee)
P. GRAY E. J. N. WARBURTON
P. T. D. GUYER J. H. PARTRIDGE
K. L. BOYES

Lloyds Bank Review

New Series | JANUARY, 1952 | No. 23

TABLE OF CONTENTS

PAGE

The Future of the Sterling Area
By Paul Bareau 1

Wages Policy in Great Britain
By Professor E. H. Phelps Brown and B. C. Roberts 17

The Future of Industrial Research and Development in Great Britain
By Professor Ronald S. Edwards 32

Statistical Section 49

The Bank publishes from time to time in this REVIEW *signed articles by exponents of different theories on questions of public interest. The Bank is not necessarily in agreement with the views expressed in these articles. They are published in order to stimulate free discussion and full inquiry.*

The Future of the Sterling Area

By Paul Bareau

THE sterling area is one of the intangible but extremely valuable assets that are being put in jeopardy by the persistent inability of Great Britain to make ends meet in its overseas payments. If the banker at the centre of the area proves by his performance that he is chronically unable to live within his means, that the standard of living on which he insists can be maintained only with the help of credit or other "assistance" from abroad, he will very soon cease to be a banker. With this linch-pin removed, the sterling system would then fall apart, to the great impoverishment not only of the banker himself but of his depositors—all the other members of the sterling system—and indeed of the whole world. The facts are so obvious, the fate so inevitable, but the whole subject so little understood by the public at large, that it would be well to set out (1) what the sterling area is and how it has evolved, (2) what changes have taken place within it in recent years, and (3) what in the light of these changes is the future that seems to lie before it.

The present membership of the sterling area includes all countries of the Commonwealth, except Canada and Newfoundland. It also includes Burma, Iceland, Iraq, Jordan and the Irish Republic. They are known as the "scheduled territories" by reason of the fact that they appear in the schedule to the Exchange Control Act of 1947.

There are three main traits by which the sterling area today can be recognized. The first is that it is an area within which there is complete freedom of payments in respect of current transactions and, with very few exceptions, comparable freedom for capital payments. The second is that the member countries normally maintain stability in their rates of exchange with sterling. The third is that the members use Great Britain as their banker, holding the bulk of their external currency reserve and working balances in the form of sterling assets and leaving Great Britain itself to hold the central pool of gold and foreign currencies that must serve the whole area.

Having enumerated these basic concepts it must, however, straightway be added that each of them is riddled with exceptions. This is in accordance with the spirit of the sterling system and the character of its evolution. Since it is not a

consciously thought-out system, and since it has evolved without any set of rules or written constitution, any generalizations made about it must be hedged with many reservations. For example, the freedom of payments within the area is by no means uniform. Certain members, notably Australia, retain the power to restrict outward capital movements, while there have been occasions when others, particularly South Africa, have taken steps to control inward capital movements from other members of the sterling area. The consistency of the exchange link with sterling has been broken on many occasions; the last was the decision of Pakistan to retain its parity with gold and the U.S. dollar when sterling and all other sterling-area currencies were devalued in September, 1949. But although the sterling-Pakistan rupee rate of exchange had to be adjusted, Pakistan nevertheless remained a member of the sterling area. The arrangements regarding the maintenance of the member countries' reserves in London are subject to an infinite range of variations. They range from the practice of South Africa, which as the greatest gold producer in the world can hardly be questioned for maintaining the bulk of its reserves in gold, to the Crown Colonies and other areas served by currency boards, whose exchange policy is in fact dictated by the appropriate Government departments in London and the whole of whose external reserves are kept in sterling. Between these two extremes there are to be found the Dominions such as Australia, Ceylon, and Pakistan, which hold separate though modest gold reserves, whose commercial banks normally maintain working balances in foreign currencies, but who nevertheless hold in the form of sterling balances the bulk and the really sensitive portion of their external reserves.

ORIGINS OF THE STERLING AREA

To appreciate the elusive nature of this currency system, its catholicity, its capacity to embrace every shade of diversity, to endure though each of its "rules" is shot through with exceptions, it is necessary to go back into history and follow the broad progress of its evolution. The genesis of the sterling area is to be found in the commercial and financial supremacy of Great Britain in the nineteenth century. As British merchants pushed their trading ventures and capital overseas they took their currency with them. In such territories as Australia and West Africa the coin of the realm—the British realm—became current. As local currency systems developed

in the territories that were to become the Commonwealth, they could not ignore this contact with the pound sterling. Nor could the territories in question ignore the economic realities of the time—the fact that their external trade was conducted almost exclusively in sterling, financed by the bill on London, carried in British ships, insured in London. Even when their exports were destined for a non-sterling country, the transaction was probably made through one of the produce markets in London or Liverpool and invoiced in sterling. Beyond this, the capital required for the development of the new territories was provided by British investors and the capital goods by British industry. Since these external debts were sterling obligations, funds had to be kept in London to meet their service. As banking systems developed in these new countries they were launched with British capital, the commercial banks often retaining their head offices in London. In so far as the resources entrusted to these Empire banks had to be held in liquid form, the London money and discount markets offered the obvious channels for their investment.

Sterling thus permeated the whole economic system of these countries. Without conscious volition, they naturally used Britain as their banker, their source of long-term capital, their shipper and insurer, their middleman and merchant. There was no dictation about this development and, indeed, no choice, for the good reason that no effective alternative could be said to exist. In no aspect of the system which thus evolved was this development more involuntary and unconscious than in the pooling of the foreign exchange income of the whole membership—a feature of the sterling area which is anything but unconscious today. This pooling occurred because the countries that formed part of the system sold their produce in sterling. Not only did they do so when they exported to Great Britain—and it was with Britain that the bulk of their trade was done—but also when they sold to non-sterling countries. Such trade would pass through one of the great commodity markets in Britain; thus sterling accrued to the producing country, while the foreign currency for which the produce was ultimately sold was earned by Britain. Britain was the middleman and the banker for the whole area. It was the banker in that it maintained not only the bulk of the other countries' external reserves but also their working balances. The currency reserves were invested in sterling; the commercial banks kept their liquid assets employed in Lombard Street and their external working balances as deposits in London.

BASIC FACTORS IN DEVELOPMENT

It should be superfluous to emphasize that the growth of this system rested on three basic facts: the world-wide acceptability of sterling, the existence in Britain of great and international commodity markets and the ability of Britain to provide both short and long-term capital for the other members. The " acceptability " of sterling is a better term than " convertibility," for the reason that no one at that time had ever conceived of the possibility of sterling ever being inconvertible. Since sterling was a truly international currency, the emergence of a sterling system was not a perceptible phenomenon. It was merged in the wider international gold standard. That standard in its classic pre-1914 period was largely controlled by London; it might thus be claimed that in those days it was the whole world that was in the sterling system. The existence of the international commodity markets in Britain, where business could be done for spot and forward delivery more efficiently than in any other market in the world, was the basis of the pooling of reserves. The external solvency of Britain, with adequate balance-of-payments surpluses for lending to the other members, was the essence of Britain's pretensions to be an international banker. These basic elements in the growth of the sterling area should be recalled whenever the future of the sterling area is under discussion—for it is unlikely that a system, however adaptable, can hope to evolve successfully if it has lost touch with the roots that nourished its formative years.

Paradoxically, this sterling system, built on the world-wide acceptance of sterling, did not become recognizable until 1931, after sterling left the gold standard. The events of that year faced all countries which had unconsciously linked their monetary system to sterling with a definite choice: whether to follow sterling in its depreciation against gold and its freedom from a fixed parity, or whether to remain on gold. This question faced every important trading country and the manner in which it was answered divided the gold bloc from what was first known as the sterling bloc and later became the sterling area. Some countries, including Australia and New Zealand, had been forced off their gold and sterling parities before 1931; they clung to sterling at their devalued parities. Others, including Egypt, India, Iraq and Portugal, kept rigidly in step with sterling when sterling and gold parted company in 1931. Others, like South Africa and the Baltic countries, hesitated a while before following sterling, but when they did

so depreciated at one stroke to the level of the pound. There were some, including the Scandinavian countries and Greece, which allowed their currencies to float into semi-independence for a time before re-linking them with sterling at varying parities.

There was no uniformity or formality in this procedure. Nor was there any homogeneity in the group of countries which chose sterling as the standard for their currencies. It included the colonies and dependencies, the Dominions (except Canada and Newfoundland), Egypt, the Scandinavian and Baltic countries, Portugal, Iran, Iraq, Argentina and Japan. Members of the "bloc" came and went without warning to or authorization from London. Most kept their currencies strictly in step with sterling's fluctuations in terms of gold, others changed their sterling parities, as for example New Zealand in 1933. Nor was there any uniformity in the relations of these members of the bloc with the banker at the centre. Some kept the bulk of their external reserves in sterling; others held it in gold; others, again, did no more than maintain working balances in London; finally, there were some late comers, such as France and Japan, whose membership was little more than a question of convenience—the choice of an anchor other than gold, whose dominion at that time was one in which the forces of deflation and deep depression held sway.

ATTRACTIONS OF MEMBERSHIP

The pull of political and sentimental ties that brought in almost the whole of the Commonwealth can be readily understood. It reinforced the economic bonds that anchored them to sterling, not least among them the powerful fact that the bulk of their monetary reserves was held in the form of sterling. The community of interests between the Commonwealth members of the sterling club was heightened by the Ottawa Conference of 1932 and the preferential tariff system to which it gave rise. It is also significant that the countries represented at this conference adopted a monetary resolution which defined the recovery and subsequent stability of commodity prices as the general objective of credit and monetary policy within the sterling area and added that "the adherence of other countries to a policy on similar lines would make possible the attainment and maintenance of exchange stability over a still wider area."

The attraction to the sterling bloc of a large number of non-Commonwealth countries is less easy to understand,

since Britain in the early 1930's was emerging from a prolonged period of depression and the prestige of sterling stood none too high. The explanation is to be found partly in the fact that, despite the economic difficulties of the late 1920's, Britain remained the paramount international merchanting and financial nation, partly in the repellent aspects of the only other alternative, the gold bloc. However we may judge the economic ethics of the methods by which the nations of the world sought in the great depression to extricate themselves from their difficulties—namely by competitive devaluation, by increased protection, in other words by attempting to pass their troubles to the backs of others—the fact remains that Britain and the sterling countries represented an area of comparative economic calm and stability compared with what was happening in the United States and other gold bloc countries. Britain maintained its national income and, what was more important in this context, the level of its imports, far more successfully than did the United States—the only other contestant for monetary leadership. In the light of that fact alone, it is not surprising that so many non-Commonwealth countries should have joined the loose and scarcely definable group of countries which chose to link their currencies to sterling, even though sterling was no longer tied to gold. But let it be remembered that throughout the 1930's, when the sterling area was taking visible shape, sterling remained a freely convertible currency and Britain retained the most important produce markets in the world.

The next and most fateful milestone in the history of the sterling area was the outbreak of the Second World War. This called for the first statutory definition of the sterling area. The system had to become an entity recognized by law because it was decided—and very wisely so—that exchange control should not operate between countries of the sterling area. Thus the members of the sterling area, later to become known as the "scheduled territories," had to be precisely enumerated. During the weeks that preceded the outbreak of war sterling had been under considerable pressure in the exchange markets and for this and for even more pressing political reasons nearly all non-Commonwealth members of the sterling area left it. When the first definition of the sterling area was made in the Statutory Rules and Orders issued under Defence (Finance) Regulations it comprised the United Kingdom and the Isle of Man, all the Dominions, Colonies, dependencies and mandated territories (except Canada, New-

foundland and Hongkong) and Egypt, the Anglo-Egyptian Sudan and Iraq. Additions and subtractions were made from time to time.

The decision to treat the sterling area as a unit from the point of view of exchange control must not be taken to imply that the control was operated for the whole area from one central point, London. That was not and is not the case. There had to be some unification of exchange control policy and technique among all member countries. If there had not been, the effectiveness of each member's control would have been reduced to that of the least exacting, given the freedom of payments within the area. But this homogeneity of control policy was achieved by co-operation among the member countries and by their recognition that it was obviously in their common interest to prevent the flight of capital, to mobilize their holdings and earnings of dollars and other hard currencies and to exercise the greatest possible economy in the expenditure of these currencies which, especially in the early days of the War, were urgently needed to purchase essential munitions and materials.

WAR-TIME EXPERIENCE

In its war-time and exchange control trappings the sterling area became what it had never been before, a group with the means ready to hand of exercising discrimination in its commercial and financial relations with other countries. That was the inevitable implication of putting exchange control round the area as a whole and leaving payments within the area free. There could be no doubt of the wisdom and practical logic of this decision under the stress of war. But a time might come when this justification would not receive such unquestioned acceptance, especially among countries outside the group.

The War brought about other changes in the relations between members of the sterling area. It introduced somewhat greater formality in the process of pooling the gold and foreign exchange resources of the members. Until 1939 this had taken place purely for reasons of convenience and as a by-product of Britain's function as banker and middleman for the sterling countries. During the War the pooling of gold and dollar reserves came to be reinforced by more strategic arguments.

In the stress of war finance, the sterling-area machinery also lent itself all too readily to a task for which it had never been intended, namely the financing of Britain's huge military expenditure in the territories of the sterling area. The habit

of treating London as the banker and holder of external reserves endured even when the payments passing were no longer of a commercial character. The overseas members of the sterling area began to accumulate the abnormal sterling balances which have come to change the face of the earlier relations between banker and customer. The traditional mechanism of the sterling system worked so smoothly that overseas military expenditure by Britain, which should have been regarded as belonging to a very special category of joint outlay made in a common effort, could be handled in the course of normal banking technique. The countries where the expenditure was being incurred were induced and were prepared to pile up credits to amounts from which they would have shrunk if the operation had been presented as a premeditated loan of the given size. The system worked too smoothly. It allowed war-time expenditures which should have gone into a special account to masquerade as ordinary commercial debts and credits and, in the course of time, to become inextricably mixed up with the product of more normal operations.

The effect of the War on the creditor status of the banker of the sterling area can be summarized in a few figures. In August, 1938, Britain held gold and dollars equivalent to £864 millions while its net banking liabilities to the rest of the world amounted to £760 millions. At that time, moreover, the banker's assets were reinforced by overseas investments of £3,545 millions. At the end of the War, the reserves had come down to £610 millions, the banking liabilities had risen to £3,688 millions, the overseas investments had been sold and reduced to £2,417 millions, and new external debts—the war-time credits raised in the United States and Canada—had accumulated to the amount of £300 millions.

By June 30th last the position had further deteriorated. The banking liabilities had risen to £4,168 millions, while the gold and dollar reserves stood at £1,381 millions. External loan liabilities, mainly to the United States and Canada, were outstanding to the amount of about £2,000 millions. Overseas investments, according to the latest estimates of the Bank of England, amounted to slightly over £2,000 millions. The change in the debtor-creditor status of Great Britain between 1938 and 1951 can be summed up in three figures. Before the War every inhabitant of the United Kingdom could be said to have, on an average, a claim of nearly £80 on the rest of the world. At the end of the War, that position had been reversed and every Briton owed the rest of the world £20. By June 30th

last, as a result of the persistent balance-of-payments deficits incurred by Great Britain since the end of the War, the position had worsened further and the average external debt borne by every inhabitant in this country had risen to £55. That is one aspect of the revolution in the light of which the future of the sterling system must be assessed.

THE PULL OF THE DOLLAR

This assessment of the future must also take into account the changed commercial relations between Britain and the rest of the sterling area. These can best be illustrated by the following table, showing the percentage of trade since 1913 between the United Kingdom and the most important countries of the sterling area.

Sterling Area Countries

	Percentage of Exports to United Kingdom					Percentage of Imports from United Kingdom				
	1913	1929	1937	1949	1950	1913	1929	1937	1949	1950
	%	%	%	%	%	%	%	%	%	%
Australia	45	38	50	42	39	52	40	44	50	52
N. Z. ..	84	75	76	73	66	61	46	50	55	60
India ..	23	22	33	23	22	65	44	30	25	20
Pakistan				20	17				29	26
Ceylon	45	41	46	33	24	29	22	22	18	20
Malaya	17	14	11	12	14	18	16	15	20	17
S. Africa	77	46	38	26	26	57	44	42	42	41

United Kingdom

Percentage of Exports to Sterling Area					Percentage of Imports from Sterling Area				
1913	1929	1937	1949	1950	1913	1929	1937	1949	1950
%	%	%	%	%	%	%	%	%	%
29	37	39	51	46	21	26	31	38	38

It will be seen from the above figures that while the United Kingdom has since 1937 become increasingly dependent on the rest of the sterling area, both for its exports and imports, the share of their exports sent to the United

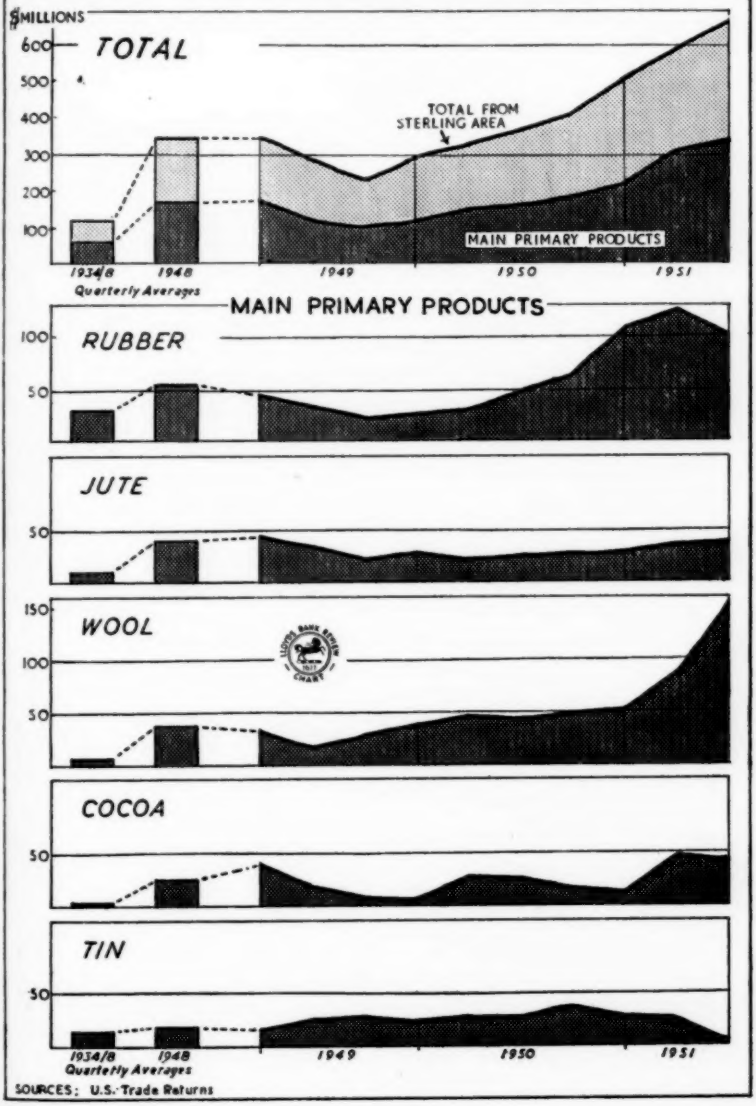
Kingdom by all but one of the countries enumerated in this table has fallen and in some cases considerably. The main reason for this phenomenon is the growing import capacity of the United States, as the table below and chart opposite show.

But there is another and, from the point of view of the future of the sterling area, a very important reason for the relative fall in sterling-area exports to Britain. It is the fact that Britain has lost much of its importance as an entrepôt trader. The great commodity markets are not what they were. Bulk buying and State trading have made serious inroads into them. Exchange control, however flexibly it is operated, is not conducive to the activities of international produce markets. But political dogma and prejudice have also done their fell work in undermining the merchanting greatness of Britain. There has been an unconscionably slow and hesitant return from the inevitable war-time closing of these markets. Let one example of this short-sighted hesitancy suffice. When at long last it was decided by the Government of the day to allow the tea auctions to reopen in London it was laid down that they should be reserved for domestic buyers. The overseas bids which once upon a time made London the greatest tea market

U.S. Imports from Sterling Area
Main Countries

	1938	1948	1949	1950	1950		1951
					Jan.–June	July–Dec.	Jan.–June
	$ m.	$ m.	$ m.	$ m.	$ m.	$ m.	$ m.
United Kingdom ..	118	290	227	335	126	209	240
Australia	9	129	98	141	70	71	234
New Zealand ..	7	30	24	64	29	35	31
India and Pakistan ..	58	291	266	291	136	155	208
Ceylon	16	53	35	66	25	41	33
Malaya	112	269	196	309	120	189	224
South Africa	16	135	116	140	59	81	89
Total from Sterling Area	**373**	**1,385**	**1,155**	**1,601**	**689**	**912**	**1,251**
Total U.S. Imports ..	1,960	7,124	6,626	8,842	3,816	5,026	6,004
Percentage of U.S. imports from Sterling Area	*19·0*	*19·4*	*17·4*	*18·1*	*18·1*	*18·1*	*20·8*

U.S. IMPORTS FROM STERLING AREA



SOURCES: U.S. Trade Returns

1951 Jan.-June
$ m.
240
234
31
208
33
224
89
1,251
6,004

in the world are now banished. The reason is the need to reconcile a " free " market with the control and subsidization of retail tea prices to the British public. To allow free competition from all the world might raise the prices and increase the cost of the subsidy. The result is that the better teas no longer come to London and that Ceylon and India are being encouraged and hardened in the habit of selling their teas direct to non-sterling consumers. And thus, in the cause of a highly questionable policy of subsidizing the cost of living, the authorities in this country have been prepared to deprive one of the great produce markets of the opportunity of regaining its former glory and importance. By the same stroke they are going out of their way to induce sterling-area countries to trade not in sterling but in dollars and other currencies. That is one of the ways in which the sterling area can be stifled and ultimately killed.

STERLING AREA GOVERNMENT

Another way in which Britain could ensure the early demise of the system would be to allow the rate of exchange of the pound to leave its gold anchor and to find its " natural " level in a controlled but flexible market. That remedy for the excessive rigidity of the British economy and for the tendency of any fixed parity to invite speculation has its devotees in high academic and financial circles. If their advice were followed today it is very doubtful if the sterling area as we know it would survive long. It is true that, as has been stressed in this article, it was in a period of fluctuating sterling rates that the sterling area found its first recognizable shape. But much has happened in the past twenty years not only to Britain and sterling but to the membership of the sterling area. The new Asian Dominions are now fully autonomous members whose monetary policies are no longer among the " reserved subjects " which in the last resort were decided by London. The sturdy independence they have brought to the membership of the sterling area is matched by that of the other members. There could now be no question of leaving to the unfettered discretion of London the choice of the day-to-day rate of sterling in terms of dollars and gold. Given the increasing extent to which the rest of the sterling area is diverting its trade directly with non-sterling countries, the relationship of their own currencies with the dollar and gold would undoubtedly be an issue on which they would want to have a say. And yet, if sterling were to move freely in a market subject to the inter-

vention of the Exchange Equalization Account, the day-to-day and almost hour-to-hour decisions about the rates at which the authorities should intervene would have to be left, as it was in the 1930's, to a handful of technicians. This is not a matter that could be decided by a committee or after reference to all the capitals involved.

Even if the cohesion of the sterling area is not tested by a development such as the freeing of the sterling-dollar rate, the whole problem of co-ordination of sterling-area policy is likely to loom much larger in the future than it has in the past. What may be called the " government " of the sterling area and the formulation of sterling-area policy have hitherto been left to the decidedly informal mechanism that has grown up with the gradual evolution of the sterling system. The Bank of England has played an important part in this mechanism, partly by the friendly personal contacts it has maintained with the central banks and monetary authorities of the rest of the sterling area, partly by the far-seeing decision to appoint men from the Commonwealth to its staff and, in one instance, to the Court of Directors. In addition, the habit has grown up since the War for the finance ministers of the Commonwealth countries to meet at fairly regular intervals and although these meetings have all too often been prompted by the regular sequence of post-war balance-of-payments crises, they are beginning to fall into place as part of the machinery through which sterling-area policy is formulated. Between these meetings the work of exchanging information and co-ordinating policy is also carried forward by two standing committees in London, the Sterling Area Statistical Committee, which as its name implies does little more than circulate relevant information, and the Commonwealth Liaison Committee, which operates at a somewhat higher policy level.

The need for still more effective co-ordination was brought dramatically into the foreground by the devaluation of sterling in 1949. This step was taken with the minimum of notice to the rest of the sterling area, though the countries concerned were very clearly and deeply involved in the decision. The resentment felt at the time by certain members at the lack of prior discussion and notice was symbolized by the refusal of one of them, Pakistan, to follow sterling in its depreciation against the dollar. It would be safe to say that a repeat performance of this procedure could not occur without seriously endangering the cohesion of the sterling area. There have been suggestions that this and similar problems of sterling-area

policy could be solved by creating yet new mechanisms, including even a sterling-area central bank. Any such development would be foreign to the whole spirit of functional evolution of the sterling area. But there is no doubt that the machinery for close and constant consultation must be improved. It may, of course, work rather better when the co-operative action is no longer exclusively concerned, as it has tended to be of late, with exhortations to economize, to cut and to discriminate.

SOLVENCY OF THE BANKER

Looking forward to the probable evolution of the sterling area, it is not the changing pattern of its trade or the mechanistic problem of its government that take pride of place. The basic issue is the solvency of the banker at the centre. The picture which emerges from the charts on page 52 is not altogether reassuring.

A word of warning should be uttered against putting too much stress on the figures for the first half of 1951. The rest of the sterling area's substantial surplus with the dollar area and the virtual disappearance of its current deficit with the United Kingdom, going hand-in-hand with the substantial increase of its sterling balances, were all part of the abnormal rise in commodity prices, some of which has already been corrected. The inordinate rise in sterling balances held for sterling-area countries will probably have been partly corrected in the second half of the year, in the course of which such countries as Australia will have seen the proceeds of their export trade considerably reduced while the spending and import habits formed on the basis of the earlier and higher prices for wool will have tended to persist. The unofficial and officially repudiated suggestions from Australia about the desirability of switching allegiance from sterling to the dollar and achieving convertibility with dollars for the Australian pound without having to wait for sterling to blaze that trail may well have been a little out of date. It is more than probable that Australia and a number of other countries which were net dollar earners in 1950 and early 1951 are finding themselves once more well and truly plunged in dollar deficits, dependent on the sterling-area dollar pool and using up their sterling balances almost as fast as they were building them up in the abnormal circumstances of the twelve months to June, 1951. They are, in other words, being made fully aware of the benefits which membership of the sterling area can confer.

The fact remains that Great Britain is still running an

over-all balance-of-payments deficit and on present indications promises to do so in the coming year. This is a situation which goes ill with the pretensions of acting as central banker for the sterling area. Great Britain is taking far too long a time to recover from the balance-of-payments difficulties that were caused by the commercial and financial ravages of war. In this fact lies the main threat to the future of the sterling system.

The non-convertibility of sterling is another unfortunate reality which must militate against the stability and permanence of the sterling area. This system would never have come into being had it not been based on a currency whose world-wide acceptability and convertibility were taken as axiomatic. The sterling area has achieved prodigies of adjustment to the abnormal circumstances created by the War, but it would be asking altogether too much to expect it to endure if the banker at the centre remains chronically unable to live within his means, if the currency which the members are called upon to hold and to use as their anchor is destined to be indefinitely inconvertible and subject to exchange control. Those "realists" who so readily propound the thesis that sterling can never again be a fully convertible currency should understand that they are in effect passing sentence of death on the sterling area.

If the sterling area were to go it would be a damaging and impoverishing development for the whole world. It would certainly damage Britain, the banker, whose earnings from merchanting, finance, shipping and insurance are inextricably mixed with its position at the centre of this great monetary system. It would also impoverish the rest of the sterling area, whose economic strength as a unit today is far greater than the sum of the strength of its separate parts. It would also impoverish the whole world because the sterling area is still the greatest unit within which trade and payments enjoy really multilateral freedom. When the United Kingdom signs a monetary agreement, or becomes the member of an organization such as the European Payments Union, it is not only Great Britain but the whole sterling area which comes into the picture and stands as party to the agreement. This fact alone has done a great deal to soften the harsh edges of the bilateralism to which Great Britain has had to be a party since the end of the War. Nor is there any alternative that could readily be placed in the void that would be created by the disintegration of the sterling area. The system is therefore an entity, little understood, often misjudged but immensely

valuable. There are many forces making for its disintegration. The most powerful of them are the continuing deficit of Great Britain in its balance of payments with the rest of the world, the prevailing impression, often fostered in Britain itself, that sterling will be a controlled and inconvertible currency for as far as the eye can see, and the consequent assumption that the sterling area will remain an area of discrimination and protection against the really competitive world. If those forces persist, the doom not only of the sterling area but of much else will be sealed. The remedies lie largely in Britain's hands. A great and irreplaceable asset is at stake.

Those remedies demand first and foremost a recognition of the fact that Britain's overseas responsibilities do not stand at the bottom of the list of economic policy priorities, with full employment and social security at the top. Secondly, they must spring from an appreciation of the dependence of external solvency on the health and vigour of the domestic economy and on the domestic stability and integrity of the pound sterling. At long last there are hopeful signs that these basic facts of economic life are being understood and that the appropriate policies are being set in motion. The greater flexibility introduced in the money and foreign exchange markets are symptoms of this new approach. The tighter rein on which the banking position is being ridden is a hopeful augury that credit policy will henceforth be used as an ally and not as an enemy, or at best a neutral, in the fight for regaining the external solvency of Britain. What has been achieved in this direction so far is no more than a beginning. Much, almost all, remains to be done; but at least the movement is in the right direction. Looking to the future of the sterling area it is possible today to take a somewhat more confident and hopeful view than would have been justified even a few months ago.

PAUL BAREAU.

December, 1951.

Wages Policy in Great Britain

By Professor E. H. Phelps Brown and B. C. Roberts

I

IT is a remarkable feature of the British economy during and since the Second World War that amid controls of many kinds there has been virtually no control of wages. The month after Pearl Harbour, President Roosevelt set up the National War Labor Board, with complete jurisdiction over labour disputes, and again in January, 1951, President Truman set up a Wage Stabilization Board. But in Great Britain the fixing of wages has continued since the War began to be carried out very largely through the same private and public processes as before. It is true that the Conditions of Employment Order (No. 1305) was adopted by general consent after Dunkirk, and kept in force until last August; this Order outlawed strikes and lock-outs, and set up a tribunal that could sit on disputes and make awards that were binding on the disputants, even though they would not willingly accept arbitration, and this was a new element in our industrial relations. Yet almost all our main wage changes have continued to be made by agreements freely reached between employers and employed. Most of these agreements have emerged from voluntary negotiations which the two sides have themselves developed and by the same token are free to terminate, and since the War these have always accounted for a half, and sometimes for as much as four-fifths, of all wage changes.[1] There are also the decisions reached after negotiation in Wages Councils and the like: these have accounted for another ten to thirty per cent. of the total. Even when claims have been brought by compulsion to arbitration, the rôle of the court has been equitable rather than administrative.

So at a time when all manner of direct controls have been imposed, and we have had direction of labour even in years of peace, we have not imposed direct controls on wages. "The policy of the Government," said the White Paper of 1941[2]—speaking, no doubt, the mind of Ernest Bevin—"is to avoid modification of the machinery for wage negotiations and to

[1] *Ministry of Labour Gazette*, article in January each year. The proportions of all wage changes are reckoned according to the percentage of the aggregate weekly amount of increase in rates of wages.

[2] *Price Stabilization and Industrial Policy* (Cmd. 6294 of 1941).

continue to leave the various voluntary organizations and wage tribunals free to reach their decisions in accordance with their estimate of the relevant facts"; and so it has continued since. The relevant facts have included the needs of the nation, as the Government has made those known from time to time; but it has been for the unions to act on them as they thought fit. There has not even been a screening of wage claims through the General Council of the Trades Union Congress. The Council has given its guarded endorsement to Government appeals in general terms, but it has been very careful not to judge the merits of any claims, or involve itself in any negotiation, for such action would be strongly resented by the unions, which look to Congress for a common purposes committee and not a federal government.

It can be claimed for this British policy that it has avoided conflicts. "The freedom of opportunity to make claims and to have them discussed has enabled industrial peace to be maintained," the White Paper said in 1941, and later experience has not refuted that. During the War, stoppages were far fewer than in 1914–18. In the four years that followed the Armistice, the average British wage-earner lost about three working days a year through disputes; in the four years after 1945, one hour a year. For the most part, our methods of wage-fixing have gained acceptance for the rates fixed, and in a free country this is an acid test for any wage policy. There has sometimes been imperfect communication between the union leaders and the working member, who has not always identified himself with the national agreements they have made; we have had "the strike against the union." But for an era of lost landmarks, of great and rapid changes in the deployment of labour and in the ratio of one man's pay to another's, the avoidance of disputes has been remarkable.

Yet the lack of central wage control has been held to constitute a serious handicap to our economy in meeting the needs of the hour. Some regard it as partly responsible for the great rise of costs and prices. In eleven years there has been a general doubling of money wage-rates. If we take an index of those rates as standing at 100 when war began, it rose by about ten points a year steadily through 1946, and by about eight points a year on the average of the five years since. Granted that this is the outcome of inflationary pressure, much of which arose independently of wage increases, have not these maintained that pressure and raised it? But more

than this: let us suppose that the inflationary gap is closed, and the demand for labour comes to match the supply at a high level of employment; even though there is now no inflationary pressure, it can still be contended that the low level of unemployment must of itself give the trade unions so great a bargaining power that they will be able to enforce recurrent rounds of wage rises. Thus it is argued forcibly that some central control of wages is essential, as a check to inflation in recent conditions, or even as a permanent part of our equipment for keeping the labour market balanced at a high level of employment.

Those who maintain this receive some not always welcome support from the advocates of central wage control as a necessary part of economic planning. In the voluntary and unregulated workings of our present methods they see a failure of co-ordination, through which the national interest is surrendered to the hazards of mere bargaining power. At its best, they maintain, the outcome is unreasonable and inequitable; at its worst, it will depart so far from an ordered wage structure as to frustrate all the endeavours of the planning authority to deploy manpower where it is needed, and link earnings with the real usefulness of the work done.

II

The case for central wage control as a necessary concomitant of full employment is likely to rest on an implicit appeal to the experience of recent years. In these, it is true, we have in one sense had full employment, but only in the sense of the general scarcity of labour which is the invariable accompaniment of any save extreme inflation. After all the changing scenes through which we have passed year by year, we see now on looking back that we have been living through an almost continuous inflation, in which the cost of living and industrial wage-earnings have alike risen by a third or more in six years. It is this inflation which characterizes the period, and a scarcity of labour is the by-product.

Let it be agreed at once that so long as inflationary pressure persists, wage rises will come about perpetually unless there is concerted restraint. It is not even necessary to suppose that the trade unions take advantage of the situation to force the pace: for the rise in prices will certainly prompt wage claims, if only to protect existing standards, and the high profit margins which inflation creates fairly generally

will enable most of those claims to be met readily. Even if the unions made no move, moreover, the competition of employers for labour would raise its price, as is very likely evidenced by the steady rise of many earnings in this country even during the period of wage restraint when the negotiated rates were hardly changed.

It is also clear that this process does not merely transmit the impact of higher spending to the labour market, but itself carries inflation further on. Labour may not take the initiative, and the rise in its price as in that of raw materials may be only the consequence of the magnitude of total effective demand; yet once a general rise in wages is effective it leads on to the next round of the spiral, for it raises direct costs, enforces price rises in the less profitable sectors where shortages had not brought such rises about already, and increases the flow of spending through the circulation of working capital.

By the same token, a period of wage restraint is a valuable aid to the removal of inflationary pressure without applying checks so abrupt that they swing activity too far the other way. It implies that a good many wage-earners accept some reduction in their real income for a time, although profit margins remain wide. It implies also that the competition of employers does not continue to raise effective rates despite the standstill in the agreed rates. Yet if none the less it proves possible, it interrupts the self-renewal of inflation, and gives a breathing space in which other measures may reduce total outlay to its due size. It is possible that the wage restraint initiated by the White Paper of February, 1948, had helped to achieve something like this in Great Britain by the first half of 1950.

Yet the use of wage restraint as a means to combat inflation does not make out the case for the central control of wages as a permanent part of employment policy, for this need not depend on inflation. It is true that full employment has sometimes been conceived so as to carry inflation with it by implication. If it means a labour market in which there are always rather more vacancies than applicants, it means an economy in which there is always some inflationary gap. If it means that sufficient demand will be created to maintain employment for the whole present labour force of each industry, whatever prices those in it set on their work and products, then it means giving a blank cheque to unions and employers alike. If it means

countering localized unemployment due to shifts in demand by raising total effective demand, then most prices will be so raised, actually or potentially, that wage claims will be stimulated and not much resisted. But these are not the only forms which full employment policy can take. It can also consist in the prevention of such unemployment as is due to a shortfall of general demand, while treating by other and localized measures the unemployment due to shifts in demand and changes in the fortunes of particular industries. The criterion of the level of effective demand here is in effect that it shall be sufficient, and not more than sufficient, at the current level of costs, to prevent all unemployment save what arises from causes specific to particular trades, and persists because of immobility. This level is not inflationary in itself, nor does it encourage rounds of rises initiated on the side of costs, for any one industry which raises its costs and product prices will tend to reduce its turnover and the number of jobs it provides. In a word, so long as those measures which change the *total* of effective demand are used only to prevent such unemployment as arises from a *general* deficiency of demand, there will be some localized unemployment, but in most industries the level of unemployment will be kept low without there being an inflationary gap.

But if unemployment is generally low, will not the trade unions be able to force rounds of wage increases even though there is no inflationary gap? And will not such increases oblige the Government to raise effective demand so as to cover them, or else accept general unemployment? This has been contended, on the ground that when a certain low level of unemployment has been reached wages always tend to rise, and this level may still be higher than public opinion will accept as constituting full employment. Generally it is assumed that a low level of unemployment in itself confers such bargaining power on the trade unions that they can force their claims through. But this is not at all certain; the *onus probandi* rests with those who maintain it. It is true that in this country most rises in money wage-rates have taken place in times of low unemployment. But we do not know that it was the low unemployment that made them possible, and not some other feature of prosperous times, such as higher profits. There can be an industry, such as the British railways in the inter-war years, in which few union members are unemployed, but there is no profit margin out of which to pay higher wages

without raising prices. On the other hand, American experience shows how technical changes which displace labour give unions the chance to get higher wages. We lack exact knowledge of the causes of changes in wage-rates, but there is at least no presumption from our general knowledge of collective bargaining that low unemployment of itself gives the unions superior bargaining power.

If that is so, it remains possible that public policy can keep general unemployment low without having to control wages. The idea of full employment must not be identified with the inflationary conditions of recent years, nor does the value of wage restraint as a check to inflation establish the need for the central control of wages in any and all conditions of low general unemployment. We shall contend that such control of itself raises many difficulties. If the present argument is right, there is no need to incur them unless and until experience has shown that we cannot maintain a balanced economy, that the only practical alternative to recurrent general unemployment is persistent inflationary pressure.

III

The case for our establishing an organized direction of wage changes has also been argued from the premise that our present methods cannot be trusted to maintain a just and efficient wage structure. To serve the national interest, and the interests of the wage-earners themselves, a system of wage-fixing must fulfil a number of functions. It must adjust the differentials between the jobs within one industry, that serve to keep up the supplies of skill, effort, and responsibility; and those between one industry and another, that guide the movements of labour towards the jobs where it is most needed. It should share out changes in national real income, and provide incentives by rewarding higher productivity, without keeping all the fruits of progress for those in the progressive trades. There is also a claim of equity: subject to any need for inter-industrial differentials, work of a given grade should not be more poorly paid in one instance than another. It has been contended that if our present ways of settling wages are left to themselves, they will achieve none of these ends: for everything will depend on the accidents of bargaining power, on irrational attachment to established differentials, and on the windfall profits or monopoly power of particular industries. To this it has been added that some form of central guidance

is desirable to extend the use of better methods of wage payment, in the interests of productivity. Some believers in planning would put the whole case more briefly, by saying that a planned economy cannot leave wages out of its plan.

The case has been urged in emotive terms, by which our kind of collective bargaining is described as a free for all, as a scramble, as chaotic, arbitrary, and unrestrained. But such words beg the question of whether collective bargaining, for all its lack of explicit order, is not actually working out the pressures of supply and demand in the labour market, and so fulfilling a function which must be fulfilled somehow in any society which leaves its members freedom of choice of job, and freedom to spend as they choose. These freedoms are compatible only if prices, of the factors of production as well as of their products, can move so as to equate supply with demand, and attract resources into uses where buyers are calling for more of them. It is true that our present methods have not been created on any such explicit principle; but the same can be said of any pricing system, in which those concerned in particular transactions make their bargains with one another without central direction: their actions in the aggregate tend to an end that no one aims at consciously in the particular. So far as wages are the price paid, ultimately by the consumer, for various kinds of work, their function is to adjust the demand for each kind to the available supply, and to induce wage-earners to move into the trades in which consumers are calling for more output. Collective bargaining may not appear concerned to adjust wages in these ways, but the record of wage movements in this country suggests that effectively it does so, and that it is the forces of supply and demand for particular kinds of labour that set the limits within which bargains are struck: for jobs have been found for millions more wage-earners, wages in expanding industries have risen relatively to others, great changes in the deployment of labour have been made without direction of labour, and the standard of living of the wage-earners has advanced in step with the rest of the community.

Our present methods work imperfectly; but there is no reason to suppose that the job would be done better by some central board, even if its every decision were willingly accepted, than by the practical knowledge and interest of those directly concerned in each bargain. In a free community, wages must respond to the push and pull of supply and demand, and it is

the people in each trade who can best gauge those forces there.

IV

Some who share the misgivings we have been discussing about the workings of unregulated bargaining believe that we should work towards greater co-ordination by developing existing consultations between the Government and national organizations of employers and trade unions, so as to work out a common wages policy, and agree at the centre on what changes can from time to time be made consistently with it. These advocates of more centralized negotiation point to what the Scandinavian countries and Holland have achieved in this way since the War.

But it is dangerous to assume that what works well in one country will necessarily succeed in another. Methods of social administration grow out of historical circumstances, traditions, and behaviour patterns, which are indigenous. Though there is so much in common between Britain and the Scandinavian democracies, in the field of industrial relations there are marked differences. In Scandinavia both the trade unions and the employers' organizations are highly centralized, and they have been so almost from their beginnings. The national centres maintain authority over their constituent unions and employers' associations by such means as centralized strike and lock-out funds. The trade unions themselves are small, and highly organized; likewise, the employers' associations; and this has promoted the development of a tradition of negotiation between the central organizations, which goes back to before the last War.

In Britain the position is very different. Here, the trade union movement is a collection of autonomous bodies, each of which jealously guards its independence, and would refuse to let the Trades Union Congress interfere in its domestic affairs. Ever since the 1870's, it is true, attempts have been made from time to time to turn the T.U.C. into a federal body with power to bargain for the movement as a whole, but each time the proposal has been overwhelmingly defeated. Nor does the British Employers' Confederation have any greater authority over its constituents. On both sides, concentration of power at the centre is regarded with lively suspicion, and if it does ever come about, it will arrive only through a slow process of organic growth.

In spite of centralization, the Scandinavians have not

been able to develop a satisfactory national wages policy. For a time Norway and Sweden resorted to a complete wage stop, but this was in the nature of a storm anchor until the inflationary swell subsided. Since the stops were lifted, wage policy has been based more on expediency than on coherent principle.

The Dutch were more thoroughgoing in their efforts to build up a system of centralized wage control, but they, too, have run into serious difficulties. Wages in Holland are controlled by the Government through a College of Arbitrators, who are advised by the Foundation of Labour, a joint body containing representatives from the central trade union and employers' organizations. The machinery was not difficult to assemble, for there are a number of national trade union centres in Holland, and each group is small, and therefore susceptible to central control. The real problems have arisen from the policy pursued by the Arbitrators. It soon became obvious that if wages were to be determined nationally, some general criteria must be found, and it was decided to carry out a national scheme of job evaluation, allotting points to occupations according to the degree of experience, independence, skill, hazard, effort, unpleasantness, responsibility, and so on, associated with them. Job evaluation is common in factories, and there are attractions in extending it to the whole economy: for then every job, it seems, can be placed in its due grade, and each worker can be shown that his relative wage is as fair as the application of reason can make it.

But there are snags in this. Historical factors will intrude, and what the worker has been paid in the past cannot be left out of account, which means departing from the apparently objective basis. It is not enough simply to rate jobs, for when one man does a job better than another, it is only fair that he should get higher pay; so merit rating and piece work and bonuses come in, but these may produce pay packets that bear little relation to the original job evaluations, and it is take-home pay that counts when the worker and his wife do their own job evaluation. Most fundamental, to maintain the evaluated differentials between jobs means ignoring the supply and demand for labour, trade by trade: employers must not offer higher rates to attract labour, or trade unions claim a rise when they are in a seller's market. So the application of this kind of wages policy demands rigid central control. Both employers and trade unions in Holland are

increasingly disappointed with the results of it, and it says much for the self-discipline of the Dutch people that they have borne with it for the past two or three years.

The difficulties that have come to light in Scandinavia and Holland are a warning that seemingly logical and centralized systems of social organization often produce unhappy consequences. The aim of the British proponents of a National Wages Board is to substitute reason for force; but setting up such a Board with statutory authority to supervise and co-ordinate all voluntary agreements and decisions of statutory wage-fixing bodies is more likely to increase disputes than diminish them. The Board would require an army of employees to collect and collate the thousands of agreements, decisions and awards made each year. Delay in ratifying them would be inevitable, and would stretch out the process of wage settlement, which is already lengthy enough, to a point at which unrest would be provoked rather than eliminated.

This is a weighty objection, but more fundamental are the problems of establishing the principles on which the Board should make its decisions, and enforcing its decisions when they are made. Let us even assume the first problem solved, and principles agreed on: how can the awards then be imposed? It is relatively easy to fix minimum wages and police them, because trade unions are vigilant inspectors, and the number of employers is relatively small; but the situation is entirely changed if the wage fixed is to be a maximum as well as a minimum. The attempt during the War to prevent the poaching of labour in the building industry by fixing a maximum as well as a minimum rate of wages under Defence Regulation 56AB was not a happy experiment. It is hard to prevent employers badly in need of labour from paying higher rates in collusion with their workers. Or, suppose the members of a trade union refuse to accept an award and go on strike: the Board would either have to give way, which would destroy the reason for its existence, or take judicial proceedings individually against a great many people, who might combine to resist those proceedings too. If the union refused to act on its members' demands, the same difficulties which began to show under Order 1305 would appear, for the rank and file would be divorced from their leaders.

The acceptance of compulsory awards under Order 1305 was possible precisely because the National Arbitration

Tribunal treated each case on its merits and did not attempt to enforce a national wages policy. Whatever popular belief may have arisen to the contrary, an analysis of its awards shows no direct effect of the White Paper on Personal Incomes, Costs and Prices.

V

An alternative procedure for wage settlement, less ambitious than those we have been discussing, but sharing with them the aims of substituting reason for force and making wage awards in some sense consistent with one another, is the prohibition of strikes and lock-outs, coupled with compulsory arbitration in the last resort. Australia and New Zealand have had compulsory arbitration (with one interval in New Zealand) for a long time, and their arbitration courts have had far greater power than our National Arbitration Tribunal. Yet their experience does not suggest that their methods, if transplanted to Britain, would be better than free collective bargaining. For there is much evidence to show that they have not fostered good industrial relations but, on the contrary, have led both sides to shirk responsibility for the rates awarded and, instead of negotiating and trying to reach an understanding, to take up rigid positions and leave it to the courts to decide. Although strikes are illegal, both countries have been plagued by industrial unrest, and in practice it has been found very difficult to suppress strikes by treating them as criminal offences.

We too in this country have had experience since 1940 of the prohibition of strikes and lock-outs, and of compulsory arbitration. Yet in practice Order 1305 did not prevent strikes; it only stigmatized them as illegal. It is true that this strengthened the hand of moderate leadership and deterred executives from ready resort to strike or lock-out as a move in bargaining; but the relative absence of stoppages since the War has been due not to compulsory arbitration but to the fact that it has been possible to agree on most wage changes in voluntary negotiations. The prohibition of strikes which the unions originally accepted at a dark hour of the War they continued to accept after the War was over, partly out of their sense of the continuing national need and their loyalty to the Labour Government, partly because the Order which contained the prohibition also made recognized terms and conditions of employment legally binding on all employers, and this was a provision which the general workers' unions and the white collar unions greatly valued. But the belief arose that the

prohibition of strikes was being used to enforce a wages stop while the cost of living was rising; the courts held that the National Arbitration Tribunal was unable to order the reinstatement of a dismissed worker, yet his fellow unionists were still forbidden to strike in his defence; the actual sentencing of dockers and gas workers came as a shock to many who would not have approved their actions. So, though the Trades Union Congress in September, 1950, upheld Order 1305 by a substantial majority, opinion hardened against it rapidly thereafter, and in August last it was replaced by an order which maintains the power of the Minister to refer disputes to a tribunal but no longer prohibits strikes and lock-outs. Experience here and in Australasia suggests that this will not increase the number of stoppages or adversely affect the temper of negotiation.

VI

Do we come, then, simply to the conclusion that the best way of regulating wages is still the old way? We can give no dogmatic answer, because we do not yet know what employment policy will prove to mean in practice as time goes on. Certainly, so long as recent conditions persist, the rejection of central wage control makes it all the more important to check inflation in other ways. Our present processes and institutions, moreover, are themselves in course of change, and people's feelings about how they ought to work change too. But there are two features of our present ways which we do think essential, and which run counter to wage-fixing according to a centrally-enacted plan. The first is that, in any free society, men will work only for rates which they themselves have some say in, and in some sense accept, and we believe that our various present ways of working wage-rates out do meet this need, as central regulation cannot do. Then, secondly, one of the social functions of wages is to reconcile the freedom of consumers to spend more on the things of which they want more, with the freedom of producers to take what job they choose. This means the mutual adjustment of supply and demand in each part of the labour market, and we believe this is better done by the knowledge and interest of those immediately concerned in each bargain than by a central authority.

Subject to this, there are some ways in which we think wages policy should develop, among the unions and in the

Government. It seems to us to be for the trade unions to reconsider that trend to more centralized negotiation, which hitherto has provided so clearly marked a line of development. The representative bargaining unit has steadily widened from the local through the district to the national area; and at the same time craft and occupational unions have often ceased to bargain separately, and have joined in industrial federations of unions who bargain for all their member groups together. The case for a national wages policy might indeed be put as only a natural extension of this process, by which union branches which have already delegated their bargaining to national executives and industrial federations should delegate it somewhat further, to the national consortium in which wage policy would be worked out for the whole world of labour.

We believe that this would only increase those difficulties to which the great size of present bargaining areas has already given rise, and instead we would raise for consideration the case for more devolution of negotiations. In times of depression, when the unions were trying to stave off wage cuts, the national bargaining area and the national rate were in the interests of the wage-earners, for they checked competitive reductions and protected the weak. Perhaps it is for this reason that standardizing rates throughout the country, instead of making the biggest advances where advances are possible, has become a main article of trade union faith. But in full employment, it is in the interests of the wage-earners that they should get the highest wages they can from the most efficient firms, and put pressure on the others to bring them up to the same standard, instead of bargaining only about national rates which must be low enough to suit the less efficient firms, and leaving higher earnings to be handed out by the more efficient firms through their own bonus schemes. It is in the interests of the community that such pressure should be exerted, that higher rates should attract workers to the firms in which their productivity will be higher, and that the workers in any firm should see that advances which they help to make in productivity there go with rises in their own wage-rates.

We have held that the Government should not try to enforce a wages policy, in the sense of promulgating the wages that particular trades should pay. But without compulsory powers, Government has great influence, and there are several reasons why it should, and indeed must, have a wages policy, in the sense of knowing and sometimes saying what movements

of wages are in the national interest. In each survey of the magnitudes of the economy, the total of wages has to be considered together with such other totals as investment, consumption, and the foreign balance; nor is it only that for forecasting one needs at least some assumption about the course of wages, but also that when Government is using its various powers to influence the course of economic activity, it must know how it would like to see wages behave. This need was shown by the White Papers of 1947 and 1948.[1]

But not merely does the Government need a wages policy as part of its economic planning: it must also know what to work for when (as in 1951 on the railways) it is drawn into the settlement of a major dispute. It is bound to be drawn in like this from time to time, as it has been ever since stoppages became so extensive as to impose hardship on the whole community; and now nationalization, though it has not really changed the position in law or in substance, has probably made the Government figure more explicitly in the public esteem as the final court of appeal for wage claims in the basic industries. Nor can it in these cases exercise only the good offices of a mediator, for whom any terms will do that both sides will accept; for the terms here are likely to mean changes in charges, and in wages elsewhere, that will run through the whole cost and price structure of the economy, and the Government is bound to put pressure on one or both of the parties to accept terms consistent with its policy for this. But it also needs a wage policy through its interest in the distribution of manpower and the raising of productivity. The first *Economic Survey* said that "the Government attaches great importance to the introduction of systems of payment and other arrangements which provide the maximum incentive to increase output." Mr. Attlee, as Prime Minister, condemned attachment to customary differentials. The attraction of labour to the jobs where from time to time more men are needed requires changes in relative wage-rates; the raising of productivity requires extension of the most effective methods of wage-payment; and both aims call in question the present suitability of some of our inherited wage structures.

The problem is to translate a wages policy developed by the Government in this sense into actual adjustments of wages. This may be done sometimes by general statements

[1] *Statement on the Economic Considerations affecting relations between Employers and Workers* (Cmd. 7018); *Statement on Personal Incomes, Costs and Prices* (Cmd. 7321).

of national needs and Government aims. Such appeals as the White Papers of 1947 and 1948 would lose their authority if used too often, and in any case they cease to be heeded as soon as circumstances change; yet there is no reason to doubt from recent experience that future directives would meet with a genuine response if the need for them was made clear. But the influence of the Government is also exerted as the day-to-day problems of industrial relations arise. This implies inquiry, discussion and policy-forming, in many workings of the labour market. At the present time, for instance, there are such questions as whether the differentials paid for skill have been too much narrowed in the past decade; whether the great changes in the relative wages of different industries have not pushed some industries into a position where their present rates are not high enough to attract sufficient new entrants; whether the introduction of incentive schemes brings beneficial results in the long run, and, if so, what schemes are best.

Working answers to such questions are needed by the Government in its daily contacts with the labour market and would, if sometimes made public, in themselves exert an influence on wage settlements. It is for consideration whether there should not be closer links between the Ministry of Labour, with its rich experience and understanding of industrial relations and the deployment of manpower, and the economic departments to whom falls the responsibility for considering the economic implications of wage settlements, so as to maintain continuous observation and inquiry, and keep all sides of wages policy under a co-ordinated review.

E. H. Phelps Brown.

B. C. Roberts.

London School of Economics.
November, 1951.

The Future of Industrial Research and Development in Great Britain

By Professor Ronald S. Edwards

ON no subject is it easier to talk platitudes and harder to make constructive proposals than on the future of British industry. Everyone is tired of *clichés* about the spirit of enterprise, better human relations, more science in industry, and the rest of the contemporary Good Things. To carry discussion beyond this stage detailed studies in industrial economics are needed, especially comparative studies with other countries. In this connection the stream of experts visiting the United States, and in particular the Anglo-American productivity teams, are making valuable contributions. Thanks to their reports our data for comparing and contrasting the British and American scenes, for explc ding myths, for removing misconceptions and for laying bare significant differences are steadily increasing.

In the present article I shall make use of comparisons with the United States wherever these are likely to throw light on matters concerning industrial research and development. But America is not the only country from which we can learn. I shall therefore extend my comparisons to Switzerland which, though like the U.S. in being an advanced industrial community, is at the opposite extreme in size, resources and dependence on external trade.[1] The U.S. has a population of 150 millions, Switzerland a population of under 5 millions. To the American manufacturer in 'most industries it is the *home* market that counts. To the Swiss manufacturer in many industries it is the *foreign* market that counts. America has large reserves of fuel, many industrial raw materials and great food producing areas. Switzerland has negligible resources of raw materials, virtually no coal and a substantial proportion of barren or infertile land. Yet despite—or because of—these disadvantages she has a reputation for inventiveness in development and design and for skill in production which puts her in the front rank in a whole range of activities from fine chemicals to machine tools—not to mention watches. Britain stands between the U.S. and

[1] I should like to take this opportunity of thanking the Rockefeller Foundation, the Manchester Oil Refinery Ltd., and Mrs. A. W. Bryher, whose generosity has made possible my enquiries into European and American research and educational institutions over the last few years.

Switzerland as regards both population and resources; not so large or so rich as the U.S. but larger and richer than Switzerland. It is useful to compare ourselves with both the largest and the smallest of the industrial communities.

I shall not altogether avoid adding to the wearisome stock of generalizations, but I shall try to be specific wherever I can. Since this may mean being wrong, I should make it quite clear that what follows must not be taken as necessarily representing the views of the Department of Scientific and Industrial Research or of any of my colleagues on the Advisory Council.

The Meaning of Industrial Research

Industrial research is hard to define but, broadly speaking, it embraces investigations into, and experimental work on, the materials, processes and products of industry. The term is normally used to include development—the stage through which knowledge won in the laboratory must generally pass before it can be effectively applied in the factory. Development may involve the production of scale models and prototypes, the setting up of pilot plants, and further experimental work in the laboratory, before success is achieved.

Thus described, industrial research sounds a formidable and expensive business; and so it often is. But it is very important to recognize that it also includes quite modest activities. All research combines the search for new knowledge with the application of existing knowledge. At the limit, research may amount to little more than the effort to discover whether and how far existing science can usefully be employed to modify existing practice in a particular firm. A firm which has, say, a process control chemist who, in his spare time, keeps his eye on the technical and scientific press, notes information and ideas that might be useful and arranges for them to be tried out, is engaged on research. Modest research, it is true; but carried on in thousands of firms such work has enormous influence on quality and cost of production.

The Strength and Weakness of the British Position

So soon after the Festival of Britain any further recital of Britain's contribution to science and technology is unnecessary. No one would dispute that we have a proud record in fundamental science and originality of invention, and there is nothing to suggest that our fertility is declining. Our university scientists maintain the standards set by earlier generations. Government research establishments and co-operative research associations also make their contributions,

some of them outstanding. In industry itself I know of nothing that suggests that our research teams are less able, or less successful, than those in the industry of other countries. Nor do I know of any evidence that suggests that British industry undertakes in proportion to its size less *basic* research than industry in other countries. In all countries—not excluding the U.S.—the winning of new knowledge is undertaken by only a very small minority of firms.

The weakness of the British position, according to most observers, is that over large sections of its industry science is not applied as quickly or as widely as in other leading industrial countries. It is very hard to prove an assertion of this kind, though if there were the space it would be possible to give examples and to quote authorities. But there would be little point in so doing for, even if some of the criticism is unjustified, the gravity of our position is such that, however we are doing, we must do better. I propose therefore to review in this article three factors which determine the speed, efficiency and extent of industrial research and development: the supply of trained manpower, the adequacy of research institutions and the economic and social framework.

THE VOLUME OF SCIENTIFIC AND TECHNOLOGICAL MANPOWER

The first, and most striking, difference between ourselves on the one hand and the U.S. and Switzerland on the other lies in the output of scientists and technologists. In 1949–50 one in every 1,400 of the British population was a full-time science or technology student in a British university or doing university degree work in a technical college. There are difficulties in comparing these figures with those for other countries because statistics on higher education vary both in basis and comprehensiveness. Approximately, however, one in every 400 of the U.S. population was at the same time reading science or technology in a college or university recognized by one or more regional accrediting associations. As the report of the Anglo-American productivity team on *Universities and Industry* points out, the proportion of students not finishing their degree courses is higher in American than in British universities and the degrees themselves are probably in most cases one year below the level of the British equivalent. Often an American master's degree corresponds roughly with a British bachelor's degree. The number of American master's degrees in science and engineering obtained in 1949–50 was

rather over one-and-a-half times the number of British bachelor's degrees in the same subjects.

The team also considered it appropriate to compare the output of doctors (Ph.D.s) in America with the output of doctors and masters in this country. On this basis the ratios were 3·5 : 1 for science and 1·9 : 1 for engineering. Thus, allowing for the 3 : 1 population factor, America's lead is not in the number of highly qualified scientists or technologists but in the large output of men educated to a standard rather below British first degree level. American postgraduate schools of science and technology are, however, expanding and when we turn to the Swiss figures it emerges that even at the higher level we have no justification for complacency. In the cantonal universities and the Federal Institute of Technology, the degree standards of which are as high as the degree standards of British universities, we find that one in 1,000 of the Swiss population was reading science or technology in 1949–50.

In short, both our largest and our smallest competitors are investing more in scientific and technological education than we are, and this remains true even after allowance is made for part-time and evening students working for degrees and higher national certificates in technical colleges, and for the recently established national colleges.

It is worth pointing out that our deficiency is *not* due to great differences in the ratio of science and technology students to other students. Of the British full-time university student population, 33 per cent. read science or technology in 1949–50 (38 per cent. if the university degree students of the technical colleges are included); the comparable figure for Switzerland was 37 per cent. and for the U.S. well under 30 per cent. The low figure for the U.S. is explained by the greater range of subjects in which degrees can be taken as compared with Europe. Thus both in Switzerland and the U.S., the proportionately larger population of students studying science and technology is really a reflection of the proportionately larger population receiving higher education of all kinds. In both countries there has been proportionately more university education than there has been here. In both countries the relations between universities and business have been closer. In both countries proportionately more university men have found careers in industry. Although the number of full-time university students in Britain is now 85,000, as against 50,000 in 1939, we are still behind our competitors.

The current demand for many types of scientists and

technologists is greater than the available supply. Although this is partly due to rearmament there is no reason to suppose that demand will fall off when the peak of the rearmament drive is passed, for international industrial rivalry is intensifying and science is certain to play an important and, in some fields, a decisive rôle. In any case our long-term need must not be based on the *current* readiness of firms to offer employment. Many firms will realize their weakness only as competition grows in severity. In the meantime, the steady expansion and improvement of our facilities for training scientists and technologists must go on, even though, as total numbers rise, there will not be a corresponding rise in the number of candidates of honours quality. The probability that the average quality of the student will fall is no reason for leaving the volume of higher education in this country substantially below the level in other industrial countries. But it *is* a reason for recognizing clearly in educational policy and practice that the needs of the flyer and the needs of the ordinary student are different, and must be dealt with differently if the best is to be done for both. This raises large and urgent issues which cannot be discussed here. There are, however, two points which should be made because they have a special bearing on the subject of this article.

University Relations with Industry

The first concerns the relations between universities and industry. I have spoken about scientists and technologists as a whole because it is extremely difficult in my judgement to draw hard and fast distinctions which are significant. There are special shortages of, for example, chemical engineers trained for development work in plant design. But the problem in general is as much a matter of mental attitudes as of syllabus content. A large proportion of the greater numbers of scientists and technologists trained in the U.S. and Switzerland are " application-minded." In Britain pure science has enjoyed higher esteem than industrial application. It is, of course, understandable that good scientists, fired by the great traditions of British science, should want the kind of work that provides opportunities of making major contributions. But there is much muddled thinking on this. It is true that pure research may be path-breaking in its results; but so may applied research. The distinction between pure and applied research is not a difference in quality or in fundamentality or in difficulty. Each may involve skill and imagination of a high order or a low one.

Those industries which were, so to speak, born in the laboratory have always had close links with the universities. They attract and retain first-class men. But the older industries have not, for the most part, cultivated a similar relationship. There has been a tendency for the industrialist to be contemptuous of the theorist, and for the university man to look down on the industrialist. The reasons are complex. No doubt ignorance of science tends to create suspicion of it. No doubt our strong tradition of apprenticeship straight from school for many of the industrial and commercial professions is hard to change. No doubt the notion that universities are confined to the social and intellectual *élite* still lingers on.

The very expansion of the university population will bring its own answers to such problems. In countries where large numbers of university men have been educated, this fact alone has meant that many graduates have had to look to industrial application as their natural career. And once the first wave has broken its way into an industry it is much easier for the next wave. Moreover, the universities of these countries, realizing that a large proportion of their graduates are destined for industry, have undoubtedly been influenced both in their attitudes and in their curricula. Similar developments are taking place in this country, but we still have a long way to go before British industry is fully accustomed to the idea of employing university men, and some way to go before application enjoys the same prestige as pure research.

Science, Technology and Economics

My second point concerns the linking of science, technology and economics in university curricula. The headlong advance of the physical and biological sciences and their impact on technology presents industry not only with new opportunities, but also with new uncertainties. It becomes increasingly important that industry should be well supplied with men and women capable of understanding the *interplay* of scientific, technological and market forces, and of framing and executing policies appropriate to the changing situation.

In recent years considerable attention has been given to courses in the United States and on the Continent which are designed to achieve this. The need for similar courses in this country is increasingly recognized. A beginning has been made at the London School of Economics and elsewhere in providing courses of economics and administration for scientists and engineers, and the Department of Scientific and Industrial

Research is making available maintenance awards for honours graduates in pure or applied science to be trained for investigation of problems in industrial organization and productivity. There is an equal need for ensuring that our economists, accountants, etc., have a very much better understanding than most of them have at the moment of science and its industrial application. On both these problems we have made a start, but there is still a long way to go in securing general acceptance of their importance and in developing courses—especially at the postgraduate level—which match the need.

In this section I have mentioned only the shortage of professional men with a background of higher education. But this is only part of the problem of training men for rapid and successful application of science in industry. It is equally necessary to increase the number of foremen and technicians whose education and training in theory and practice enable them to appreciate, support and carry out the plans of the scientists and technologists. Here again we have much to learn from Switzerland. The high quality of her free primary and secondary education provides a large pool of good industrial recruits, but in particular it gives the technical schools an excellent basis on which to build their courses. Swiss technologists would be the first to acknowledge the importance of this in the speed of their development work.

RESEARCH INSTITUTIONS

I turn now to the second of my main topics. In 1947 the F.B.I. estimated that £30 millions per annum was being spent and 45,000 people (including 10,000 graduates or equivalent) employed on research and development in the laboratories and workshops of British industry. But although individual firms carry out the bulk of industrial research in Great Britain, institutions play an important rôle in nearly all industries and in some industries the principal rôle.

First, there are some forty co-operative research associations. These are associations, usually formed on an industry basis, of which firms become members by subscription. They undertake programmes of research and allied activities determined by a council composed mainly of representatives of the member firms. Each association is autonomous but receives from the D.S.I.R. a grant which is related to the income the association collects from industry and to the public importance attached to the work it is doing and likely to do.

With steady encouragement from the D.S.I.R. these

associations have been built up over the last thirty years and they now cover a wide range of industries—cotton, wool, linen, rayon, iron and steel, non-ferrous metals, production engineering, ship-building, motor vehicles, laundering, boots and shoes, and so on. I estimate the total membership at some 10,000 firms. The total income of the associations is now about £3½ millions per annum of which Government grants account for about £1¼ millions. They employ nearly 4,000 people of whom about 1,000 are of graduate standing.

Secondly, there are a number of state-owned laboratories engaged on industrial research. Those under the D.S.I.R. include the National Physical Laboratory and the stations concerned with building, chemicals, fire, food, forest products, fuel, hydraulics, mechanical engineering, radio, roads, pest infestation and water pollution, all of which in greater or lesser degree undertake research of importance to industry. The gross expenditure of these stations is now about £3 millions per annum and the number employed approaches 4,000. Each station has a governing board drawn from the universities, industry, Government and elsewhere, which has responsibility for the research programme and its general supervision. Other Government departments also have research stations of importance to industry; for example, the Ministry of Supply has laboratories for research on telecommunications, gas turbines, aeronautics and, of course, atomic energy.

Thirdly, there are the universities which are now spending more than £22 millions per annum. How much of this is attributable to research it is impossible to say since no analysis is available. Most universities have departments of physics, chemistry, engineering and metallurgy, and some have technological departments, concerned with, e.g. glass, fuel, textiles, mining and brewing, in which research is being undertaken both by teachers and postgraduate students.

Fourthly, to complete the picture, mention should be made of the private consultants, a few of whom undertake work which can be properly called research.

Research in the United States

International comparisons of research effort are notoriously difficult because of the problem of definition and the inadequacy of the statistics. Such figures as are available suggest that, in proportion to population, the research effort of American industry is not substantially higher than that of British industry. The really important advantage which the U.S. enjoys lies in

the vigour with which knowledge is seized and applied even by firms which may do little or no organized research.

The institutional differences between the two countries are significant. Co-operative research is far less important in the U.S. than in Britain. Trade association laboratories employ under 1,000 workers, and not all of these are on co-operative research. On the other hand, a great deal of research is contracted out by individual firms to laboratories which undertake it on a confidential basis. The bulk of this business is handled by privately-owned consulting laboratories and institutes for sponsored research.

There are a dozen or so substantial privately-owned consulting laboratories and many smaller ones. They employ some 9,000 workers though a proportion of these are engaged on advisory work and routine testing and not on research. The institutes for sponsored research are laboratories which enjoy " non-profit-making " status and hence freedom from Federal taxation. With the exception of the Mellon Institute, which has a special fellowship system, they undertake research projects on the same general basis as the private consulting laboratories. The sponsor, who may be an individual, firm, trade association, or Government agency, pays a fee based on the cost of the work and is entitled to any property, such as patent rights, arising from the research. There were three important institutes before the War and four or five more have since been established. They have grown rapidly in size, and six of them together now employ over 4,000 workers. Some of them have the advantage of endowments but others depend entirely on their earnings.

Some of the universities, and especially the institutes of technology, also play a part in this field. Besides free research financed by endowment, gifts, etc., they undertake research on contract from Government and industry, choosing as far as they can those projects which have educational significance and scientific interest. Thus, in 1948–49 research contracts (mainly Government) at the Massachusetts Institute of Technology amounted to $15 millions. They met 28 per cent. of the academic salary bill, made a substantial contribution to overheads, provided finance for hundreds of postgraduate students, and employed a large supporting research staff.

American industry is well supplied with facilities to which it can contract research projects and there is evidence of a solid demand both from firms with laboratories of their own and firms without. Nevertheless it should be pointed out that,

to an important degree, these facilities owe their growth to the huge expansion of U.S. Government spending on research. Although there are some Government laboratories, great reliance has been placed on extra-mural facilities. Four-fifths of the army and navy research is done on contract, the basic investigations in the universities and the development work in industry. The Office of Naval Research is probably the principal supporter of fundamental science in the U.S. It has been stated that its university programme is carried out in more than 200 institutions and that its budget amounts to nearly 40 per cent. of the nation's total expenditure on pure science. In America the navy carries out an important part of D.S.I.R.'s work in this country!

Research in Switzerland

Let us now turn to an equally brief sketch of the position in Switzerland. As in Britain and the U.S., the larger part of the industrial research is done in the laboratories and workshops of firms. There are no statistics of Swiss industrial research but, so far as my observation goes, Swiss industries do not appear to be much more heavily engaged on research than the comparable British industries. It is in diligent, thorough application of knowledge that Switzerland excels.

Again, there are interesting institutional differences. In Switzerland co-operative research plays a much smaller part than it does in Britain; smaller even than in the United States. Moreover, there are few consultants who carry out substantial research projects, and nothing comparable to the sponsored research institutes in the U.S. Certain Government institutions serve Swiss industry, the most important being the Materials Testing and Research Institute at Zurich and St. Gallen. The Federal Government also votes credits for the creation of employment opportunities, through which grants are made for research projects to universities and other approved institutions. But even taking this into account the Swiss Government spends *directly* on industrial research only about half as much per head of population as the British Government spends (1948–49 figures). Government research establishments play a much smaller part than in Great Britain and probably smaller than in the U.S.

Switzerland has preferred to rely on the cantonal universities, and especially on the Federal Institute of Technology at Zurich, in which is concentrated over half the pure and applied scientific teaching and research undertaken

in Swiss universities. As a Message from the Federal Council to the Federal Assembly put it: "We consider it an advantage in our small country that research is practised side by side with teaching at our universities. The teacher who himself is a research worker is particularly qualified to develop the research sense in his audience." The university institutions have undoubtedly played a major rôle in the development of Swiss industry, both in supplying trained manpower and in research.

The relations between Swiss universities and industry are close. Industrial scientists act as professors-extra-ordinary, and industrial firms have been generous with endowments and gifts. Although Swiss universities, including the Federal Institute, do not undertake sponsored research projects for private industry to the same extent, relatively, as do American universities and technological institutes Swiss professors individually have very close links with firms. These close links are due to the large number of Swiss university men who are themselves in industry, to the high mutual regard there is in Switzerland between industrialists on the one hand and university men on the other, and to the fact that Swiss scientists are on the whole " application-minded." Most Swiss appear to have a respect both for learning and for money-making.

Co-operative Industrial Research Associations

Of the many questions that arise from these international comparisons, there are three that are important to consider here. First, how is it that America, our largest competitor and Switzerland, our smallest, can do extremely well without co-operative research on the British scale? In Switzerland I found the majority of industrialists sceptical of the profitability and usefulness of co-operative research. Opinion in the U.S., so far as I have been able to test it, is divided; it is certainly not enthusiastically in favour of developing co-operative institutions. Have we in this country been on the wrong lines? I think not. In most industries there is a field of background research which can be cultivated more economically by firms working together, and which is not of a type to detract from the competitive position of the individual firms. This research may not necessarily interest the universities or they may not be undertaking it sufficiently quickly from the point of view of the industry. In these circumstances, for the firms in the industry to set up an institution, to finance it by *voluntary* subscription and to give it guidance and help in formulating a research programme is

in no way inconsistent with competitive private enterprise. Equally, a co-operatively financed association which collects scientific information from all quarters and puts it in a form in which it can be passed on to the firms in the industry through reports and, where necessary, visits, can be valuable without interfering with enterprise.

The associations help to ensure that industry knows of, and makes use of, existing knowledge. While great areas of British industry are so poorly supplied with men of scientific training the associations can, through their information and liaison services, to some extent compensate for this deficiency.

The Government grant is justified as a device for getting associations started and, once started, for stimulating research and other activities over and above the rate that would come about commercially where for reasons of public policy such as defence, public health, or the balance of payments, this is considered desirable. To my mind the grant is especially justified in those cases where the associations are making substantial contributions to technological education. Financial partnerships between industries and the State on these lines are sound provided that there is no pampering, that the negotiation of grants is pretty hard-headed, that the Government makes sure it gets value for public money and that it does not keep sickly associations alive too long.

Facilities for Sponsored Research

The next point to consider is the striking difference between this country and the U.S. in facilities for confidential sponsored research. A small amount of confidential work is done for individual firms by Government research stations, by co-operative research associations and even by universities. Since the end of the War two private enterprises have been set up for sponsored research. But their scale is modest and it is sometimes suggested that British industry suffers from insufficient facilities for this type of work. It is very important here that we should not confuse symptom with cause. If industry were needing more facilities for research projects, existing facilities would doubtless expand and new facilities come into existence through private initiative. That the facilities are so much more meagre than in the U.S. is almost certainly due to the facts that technological competition is not as strong here as it is in the U.S., and that fewer firms have executives who appreciate the contribution that science can make.

As the number of scientists and technologists in British industry grows I should expect an expansion in the demand for sponsored research to which private enterprise would doubtless respond. But it is my view that the stronger research associations should also play a part by developing, as an extension to their existing advisory services, facilities for sponsored projects which do not clash with their co-operative programmes. There is, of course, the danger that such a step would imperil the co-operative nature of the associations. But it should be possible to avoid this.

I think there is also much to be said for more university participation in this field. Through sponsored research projects American universities train large numbers of men at the postgraduate stage in well-equipped laboratories and workshops. Some of the training is narrow, but in general this close interweaving of sponsored research projects and post-graduate study gives students an opportunity both of earning their keep and of becoming acquainted with the latest processes and techniques.

An increase in the volume of sponsored projects in the universities would raise the " prestige " of industrial research and application among young scientists, and would be an additional source of university finance. It may be said that today few men who ought to be doing research in universities are unable to do so for lack of money. The Government grant to the universities is large; and the D.S.I.R. maintenance awards probably take care of the majority of those young graduates who should be encouraged to stay on for research training. There are, for more senior men, D.S.I.R. Senior Research Awards and Grants for Special Investigations, as well as Research Fellowships provided by the Imperial Chemical Industries Ltd., and other firms. But as the pressure of international competition is increasingly felt, and as industrial demand for scientists with postgraduate training grows, we may very well want to expand the scale of university activity above the level made possible by Government grants and industrial endowments. If so, I believe that a good way to do it is to encourage an expansion of sponsored research.

Of course, there are dangers. The freedom of the teacher to dispose of his research time might be usurped. Many sponsored projects would emphasize design and construction problems rather than fundamental scientific enquiry. Secrecy might be a condition of some projects. At the moment the weight of opinion is probably against the development of

sponsored industrial research in British universities. Yet in a country such as ours, where the need is to harness science to industry but the inclination is to pursue science for its own sake, I believe that, with appropriate safeguards and on a cautious scale, the risks are worth taking.

Universities, Research Associations and Government Research Establishments

My third point is that there should be closer collaboration between universities, research associations and Government research establishments in regard to postgraduate studies. I will put the point in terms of research associations. Nearly all of them assist the education of their own staffs, up to degree and even higher degree level (normally the external London degree). Some offer bursaries to graduates to work in the laboratories of the associations before going into industry. Some have systematic training courses for their members' staff. Some work closely with technical colleges. But where they possess special knowledge, skills and equipment for research in their industry, it should be possible to link them more effectively than is commonly the case at present with education and training at postgraduate level. Students interested in applied work might secure some of their practical research training on research association projects. The universities would thus benefit from an expanded range of facilities for the postgraduate training of technology students, and the research associations would benefit from the intellectual stimulus which comes from university work. University regulations would require alteration in some cases, but I think that more experiments than are at present being tried would be well worth-while.

THE ECONOMIC AND SOCIAL FRAMEWORK

Because they are less often discussed in financial journals I have devoted most of my space to questions of education and research institutions. But equally important is the general economic and social framework in which industry operates. The very heart of our problem is to create a situation in which industrialists, great and small, have not only the knowledge but also the necessary resources and, most important of all, the urge to keep ahead.

While it is true that, viewed collectively, the vigorous exploitation of science and invention is an excellent investment, the outcome of individual projects may be highly uncertain. A low aggregate of capital accumulation, a dwindling number

of individuals with a sufficient margin for risky enterprises, a situation in which the net yield from success in one project is insufficient to cover the capital loss from failure in others, all militate against uncertainty-bearing.

Since the War we have established institutions which alleviate some of the effects of high taxation—the National Research Development Corporation, the Industrial and Commercial Finance Corporation and the Finance Corporation for Industry. Given enterprising, imaginative and vigorous direction, the N.R.D.C. will stimulate the development and exploitation of inventions from public, university and other laboratories. The I.C.F.C. will provide small and medium-sized concerns with capital for expansion. The F.C.I. is carving out a place as a risk-bearer in the development of new scientific industries. Each of these institutions is an important, perhaps an essential, part of the pattern of industrial development in this country. But will this growing concentration of investment decision-taking into fewer hands, skilled and experienced as they may be, prove an adequate substitute for the more widespread decision-taking that was possible when taxation levels were lower? Will the scales be weighted too heavily against the oddity who is determined to go ahead against the advice of the wise and the knowledgeable, and once in a while proves to be right?

A country bent on development needs resources to " play with." It must not consume to the point where capital accumulation is so small that there is no margin for the chancy project. It must not treat profitable investment in such a way that mistakes are not worth risking. It must not pin its faith on being able to find small numbers of men of high ability and reputation who will spot the revolutionary advances, sponsor these and reject the probable failures, for to do so is to fly in the face of history.

It is hard to resist the conclusion that our present economic arrangements, and especially the level and incidence of taxation, weight the scales too heavily against the supply of capital for risk-bearing. But in any case supply of resources, though essential, is not enough. There must be forces at work that make men want to bring these resources together, make them want to overcome all the difficulties inseparable from industrial development, make them want to build new enterprises.

From the belief that only the opportunity for gain would generate such forces, opinion in many quarters seems to have swung to the other extreme. It is argued that decisions on the

level of research, and the pace and direction of development, are today taken by salaried company officials who do not stand to make or lose large sums as a result of their decisions. It is also argued that these men do not shrink from heavy risks because the risks, though large in themselves, are small in relation to the total activity and resources of the organizations they serve. There is something in both arguments. But this generation of business-leaders was reared in older traditions. We have not yet seen industry led on a wide front by men reared in the equivalent of the traditions of the administrative civil service. It may be that the high standards which such traditions inculcate would, if they were generally adopted in large-scale industry, keep it moving forward at a pace adequate to meet international competition. But even if this were so, it would not solve the problem of how the best of the small and medium-scale businesses are to make their way forward and to replace the giants of the past, and how the worst of them are to be improved or eliminated.

It would be a bad misreading of the situation to conclude that only vast organizations can in future play a part in development. One of the most striking features of the Swiss scene is the extent to which firms employing only a few hundred people are, through judicious specialization, able to make important contributions. Small firms have by no means been written off by the march of science. But the conditions must be such that they are under pressure to seek out and use new knowledge. At present too many firms in Britain are merely passive recipients of knowledge strenuously thrown at them by public and semi-public institutions. The reduction of inflationary pressure, a return to conditions in which the price system removes the inefficient and enables the efficient to expand and develop are likely to be more effective in harnessing our scientific knowledge to industry than any institutional change that can be suggested.

But the roots of the problem lie deeper. Development brings change and turmoil, competition brings worry and sometimes hardship. Though acceptance of these conditions and willingness to face their consequences are the essential prerequisites of success in international trade, we have tended to reject them in our attitudes to industrial organization. In contrast to the general attitudes in the U.S. and Switzerland, we in this country account orderliness and co-operation greater virtues than inventiveness and rivalry. But efficient industrial organization calls for all these qualities. In our

system of social values, as well as in our system of economic rewards and penalties, the determination to force through new developments, to take the risks and assume the burdens that this implies, will have to regain some of the prestige that they have lost over the last half century.

CONCLUSION

I will briefly summarize the situation as I see it. First, we must hold our position in basic science. Here there is no cause for disquiet. Whatever shift may take place in the balance between pure and applied research is more likely to strengthen than to weaken our economy. There are no signs that the shift has gone, or is likely to go, too far. Secondly, we must increase the supply of manpower for the exploitation of science. Although we are remedying our weaknesses here we still have a long way to travel before we reach equality with other great industrial Powers. Thirdly, although our research institutions are well adapted to our *present* needs, as the scientific level of industry rises, and technological competition becomes keener, the demand for facilities for sponsored research will grow. In my view the research associations and the universities should play a part in this development. It is also my view that the universities, the research associations and the Government research establishments ought, wherever practicable, to be more closely allied for post-graduate training than is commonly the case today. Fourthly, the new financial institutions, however well they are run, cannot fill, and cannot be expected to fill, the gap in the financing of " long shots." Science and invention are not likely to be harnessed as speedily and effectively as our international position demands unless the burden on capital accumulation is reduced. Lastly, since other social aims will continue to curb the extent to which economic motives can be harnessed, it is the more important that pertinacity and initiative in industrial development should be rewarded by social esteem. In bringing this about our schools and universities have a vital rôle to play.

RONALD S. EDWARDS.

London School of Economics.
December, 1951.

Statistics: Explanatory Notes

U.K. Balance of Payments.—The marked deterioration in our overseas accounts that set in during the first half of 1951 is evident from the charts on page 52. For these six months there was an over-all *deficit* in our balance of payments of £122 millions while by November the position had so worsened as to imply a prospective deficit for the second half of the year of about £350 millions. In the latter part of the year, moreover, some of the overseas members of the sterling area themselves moved into deficit with the dollar area. As a result, there has been a steep fall in our exchange reserves. Further, the surplus in our own trade with the rest of the sterling area was only about half what it had been in the comparable period of 1950 so that our sterling balances have been mounting rapidly.

The Defence Burden.—In the fiscal year 1951–52, American expenditure on defence, including military and economic aid to other countries, is likely to exceed 70 per cent. of total Federal spending and to represent about 17 per cent. of the U.S. national income. In this country, expenditure on arms was estimated in the budget at almost a third of total Government expenditure in the current fiscal year, which would make it equivalent to some 13 per cent. of national income. Defence expenditure in the U.K. during the current fiscal year is estimated, on the budget forecast, at just under £30 per head, equivalent to about 12 per cent. of the average personal income in this country. In the U.S. the comparable figure would be about 20 per cent. It now appears, however, that actual U.K. expenditure in 1951–52 will be less than that forecast at the time of the budget.

Coal Stocks.—Up to the beginning of December, total home consumption of coal showed a rise of over 6 million tons compared with 1950. Stocks in hand were, however, higher—even in relation to this increased demand—than at the beginning of the previous winter. The exception here, as the chart on page 54 brings out, is domestic stocks—at the end of November, merchants' stocks covered only 2 weeks' sales to domestic consumers, against 3 weeks a year earlier.

Steel.—Production in 1951 is likely to be somewhat less than in 1950, when output reached a peak of 16·3 million tons: for the eleven months to November, production each week averaged 303 tons, against a weekly average in 1950 of 313 tons (first chart page 55). Stocks of steel and scrap fell sharply last year and by the autumn were lower than at the beginning of 1948. The volume of exports of iron and steel and manufactures thereof also declined in 1951, after the increase during the previous year. In value terms, however, the level of exports has shown little change.

Interest Rates.—The rise in Bank Rate to 2½ per cent. at the beginning of November marked the first change in over nineteen years, apart from the short-lived increase on the outbreak of War (page 56). The abandonment of the gold standard in 1931 and the inauguration of "cheap money" in the following year ushered in a pattern of interest rates radically different from that existing in the 'twenties. Formerly, the Bank Rate changed frequently and often rose to levels of 6 per cent. or even higher. This was true also of the Treasury bill rate, the recent rise in which

still leaves it well below the rates ruling up to 1931. The yield on Consols, in contrast, has risen almost continuously since 1946, to approach the levels of the early 'thirties.

Bank Deposits.—Adjusted for seasonal variations, there was relatively little movement in net deposits during 1951, except for a brief increase in April. The last two charts on page 57 show, over a period of years, the relationship between deposits and national income on the one hand and the yield on Consols on the other. It will be seen from the last chart that there is a fairly close correlation between the curve depicting changes in the yield on Consols and that which expresses national income as a percentage of deposits. In years when national income has been increasing at a faster rate than deposits—as during the late 'thirties—this has been associated with falling gilt-edged prices or, in other words, with a rise in the long-term interest rate.

Production and Trade.—As will be noted from the first chart on page 58, the trend of industrial production, after continuing to rise during 1950, has recently tended to level off. In the period January to September, 1951, production was 4 per cent. greater than in the same months of 1950—the same percentage increase, in fact, as was assumed in the *Economic Survey* for the whole of 1951. In the comparable period of 1950, however, the increase over the previous year amounted to over 8 per cent.

The overseas trade charts bring out, in particular, the enormous increase in our import bill last year. Not only have import prices risen steeply, although since July there has been some decline, but the volume of imports has also increased—in the first nine months of 1951 the volume was 14 per cent. higher than in the corresponding period of 1950. Improved supplies of raw materials and semi-manufactures for use in industry were responsible for most of this increase. Exports, in contrast, have expanded but little and for the period January to September, 1951, were only 6 per cent. more in volume than in the same months of 1950.

Housing.—In the last three years the number of new houses erected has been running at rather more than half the average built in the period 1935–38, (first chart page 59), the great majority of these, in contrast to the pre-war position, having been constructed by local authorities. It is estimated that expenditure on housing is now a somewhat smaller proportion of total capital formation than before the War, the corollary being that outlay on industrial plant and machinery has become relatively greater.

Relating new houses built to population, Sweden had the highest figure in 1950 for the European countries covered by the last chart. In this country approximately four houses were erected for every 1,000 people. The comparatively low figure for France would be about doubled if reconstructed houses were included in addition to new dwellings.

Price Trends.—Since last summer, when import prices reached a peak of more than 40 per cent. above the 1950 level, the terms of trade have moved slowly, but continuously, in our favour—import prices have fallen while export prices have continued to rise. There has been a sharp reduction, in particular, in the prices of some leading sterling-area primary products. This down-turn in world commodity prices has been reflected in a decline in the prices of materials used in manufacturing industry (page 60), while the sharp increase in general wholesale prices has also tapered off. Retail prices continue to rise, although at a slower rate than during the first half of 1951.

Of the individual commodity prices charted it will be seen that rubber and wool experienced the greatest fluctuations in 1951. Wool (tops '64s), for example, after reaching a peak of 348d. per lb. at the end of March had fallen by the end of September to 122d. per lb., from which, however, there has subsequently been some recovery.

World Trade.—Although the percentage of world exports accounted for by the U.S.A. has declined from the high levels of 1946 and 1947 it still remains above the pre-war figure, while U.K. exports, as a percentage of the world total, are somewhat less than before the War (first chart page 61). In volume, our exports since the end of 1950 have been well over 50 per cent. greater than in 1938. Compared with 1948, however, the expansion has been less than for other O.E.E.C. countries, whose exports have shown a striking recovery over the last three years.

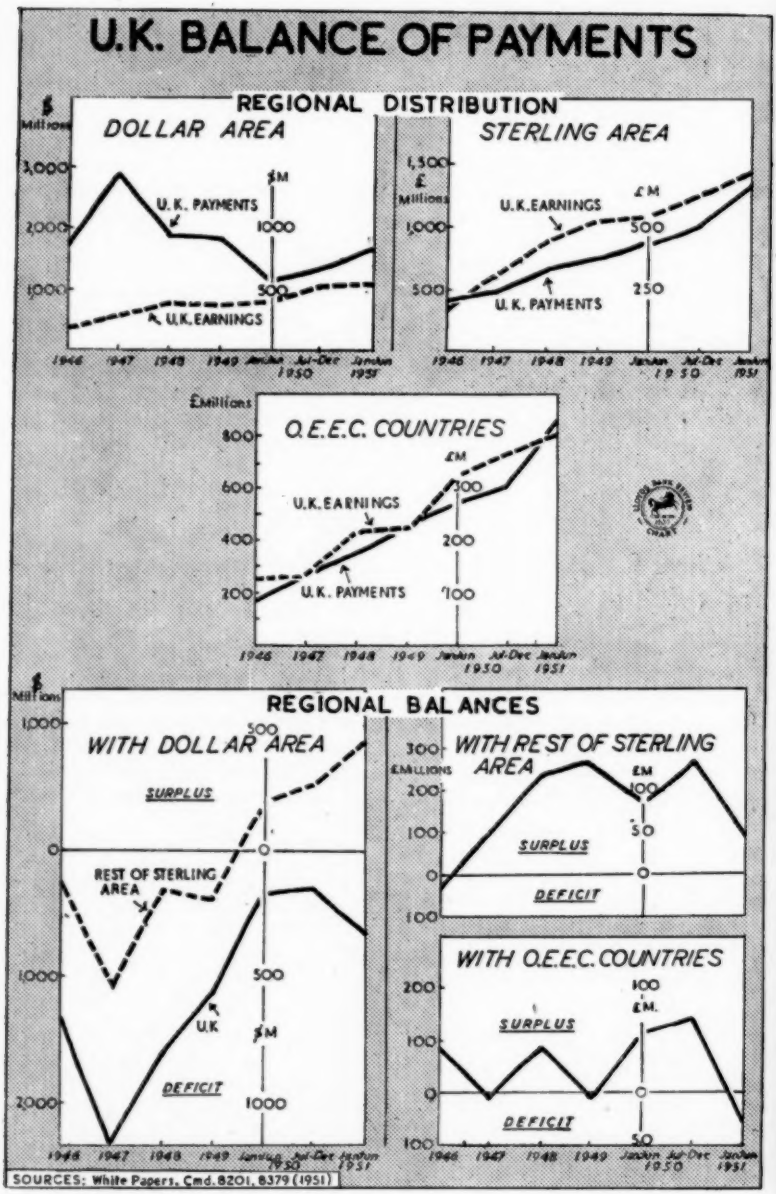
European Payments Union.—By the end of September last the sterling area became, for the first time, a net debtor with E.P.U. Since the spring each month has shown a deficit in our transactions with E.P.U. and by November we had paid back all the gold we had previously received plus a further $98 millions' worth. Germany, in contrast, has continuously improved her position since early last year.

Books and Publications

THE PROBLEM OF LONG-TERM INTERNATIONAL BALANCE

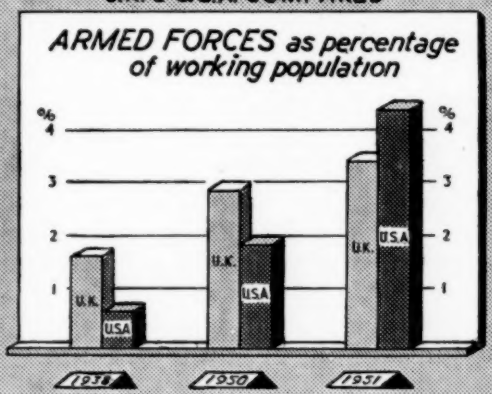
(International Economic Association)

This booklet contains the record of three Round Table discussions on balance-of-payments problems held by the newly-founded International Economic Association at Monaco in September, 1950. Also included are a number of background papers prepared for the meeting on more specialized aspects of the general topic. The summaries of the discussions themselves are necessarily somewhat compressed, any elaboration of argument being largely omitted, but they still make stimulating reading.

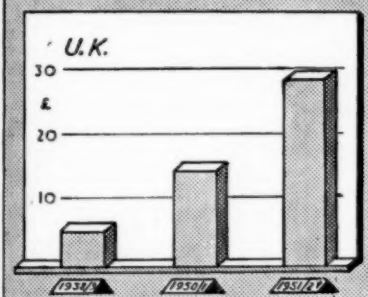

U.K. BALANCE OF PAYMENTS
REGIONAL DISTRIBUTION
DOLLAR AREA
$ Millions
3,000
2,000
1,000
U.K. PAYMENTS
U.K. EARNINGS
$M
1000
500
STERLING AREA
£ Millions
1,500
1,000
500
U.K. EARNINGS
U.K. PAYMENTS
£M
500
250
1946 1947 1948 1949 Jan-Jun 1950 Jul-Dec 1950 Jan-Jun 1951
£millions
O.E.E.C. COUNTRIES
800
600
400
200
U.K. EARNINGS
U.K. PAYMENTS
£M
300
200
100
REGIONAL BALANCES
WITH DOLLAR AREA
$ Millions
1,000
0
1,000
2,000
SURPLUS
REST OF STERLING AREA
U.K.
DEFICIT
500
$M
1000
WITH REST OF STERLING AREA
£MILLIONS
300
200
100
0
100
SURPLUS
DEFICIT
£M
100
50
WITH O.E.E.C. COUNTRIES
200
100
0
100
SURPLUS
DEFICIT
100
£M.
50
SOURCES: White Papers, Cmd. 8201, 8379 (1951)

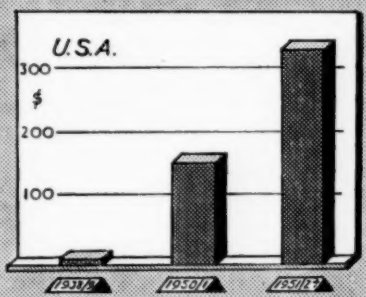
THE DEFENCE BURDEN

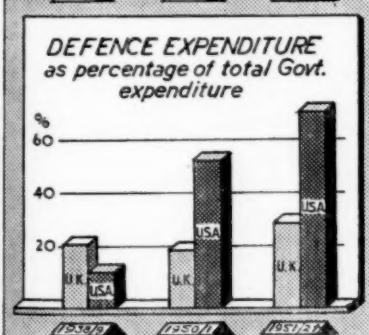
U.K. & U.S.A. COMPARED

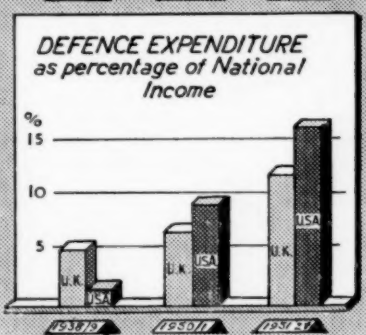


DEFENCE EXPENDITURE PER HEAD





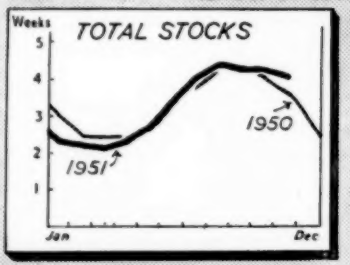


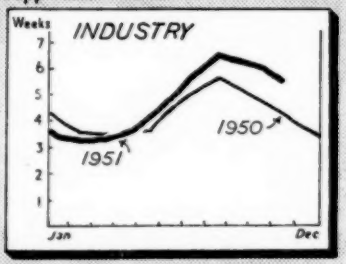


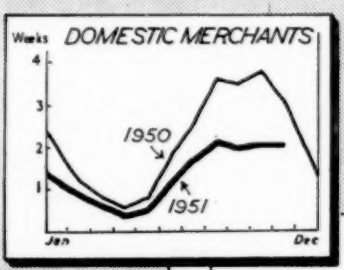
NOTE: Defence expenditure for U.S.A. in 1950/1 and 1951/2 includes international military and economic aid.
SOURCES: Official Publications
* Estimates

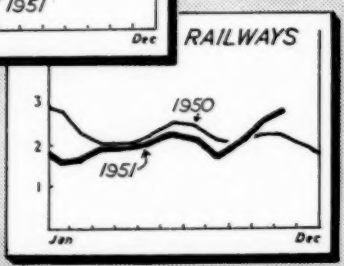
COAL STOCKS

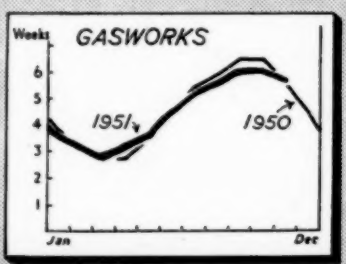
Number of weeks' supplies in hand

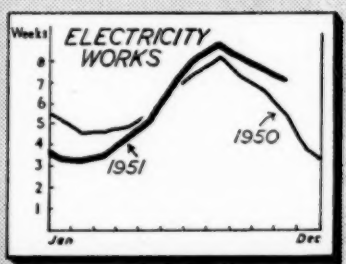






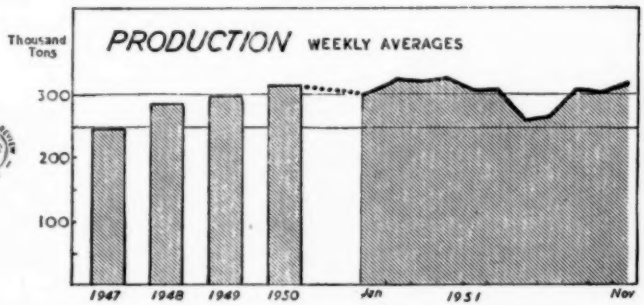


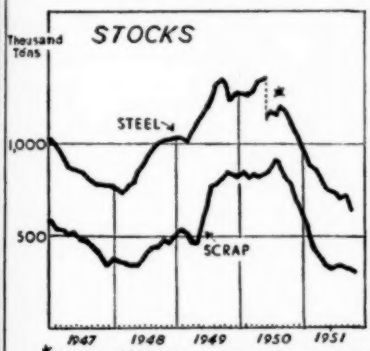


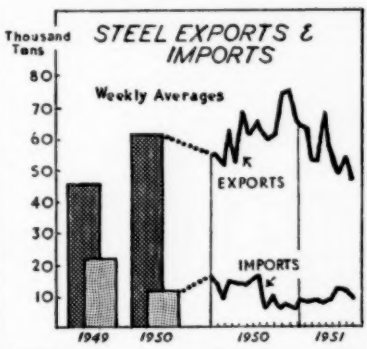


SOURCES: Monthly Digest of Statistics
Ministry of Fuel & Power

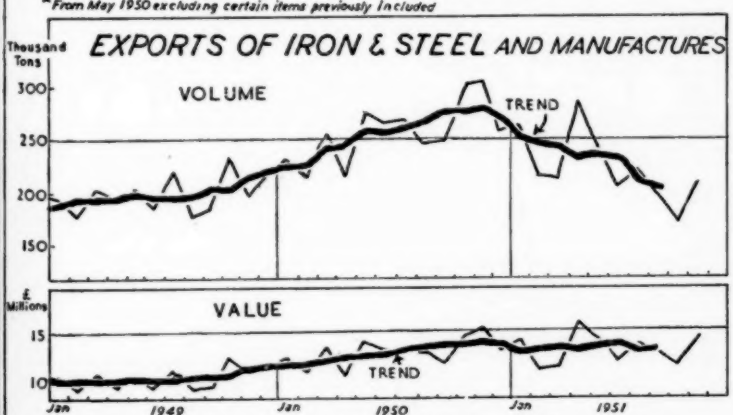
STEEL



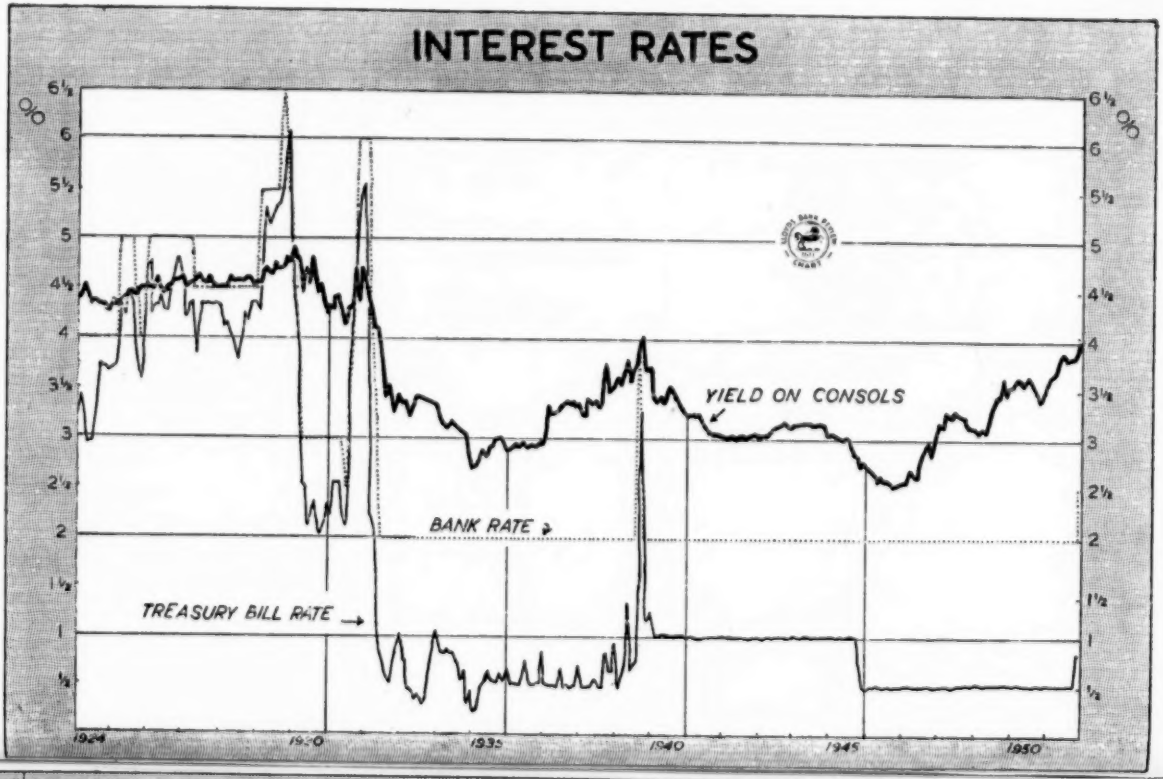




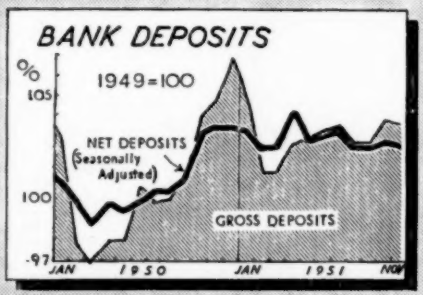
* From May 1950 excluding certain items previously included

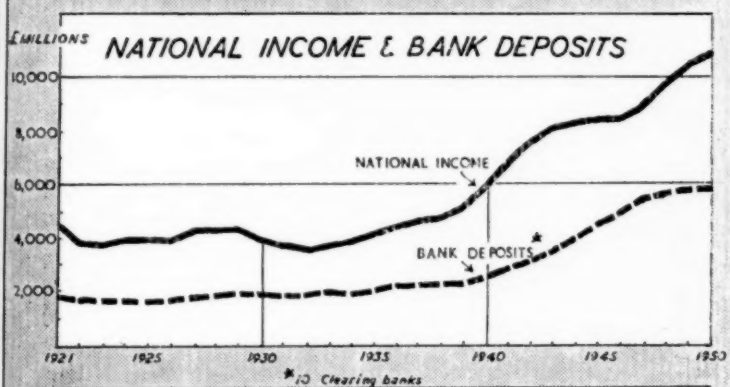


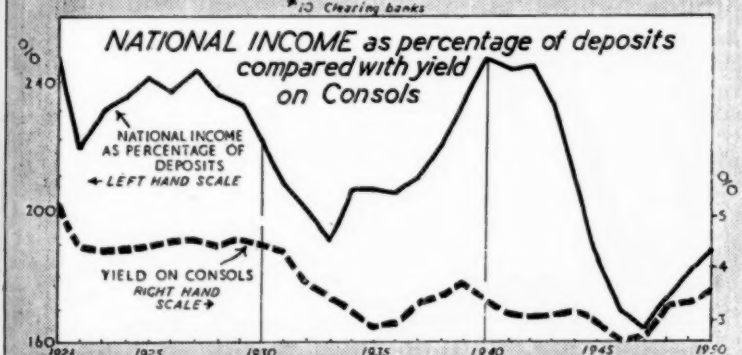
SOURCES: British Iron & Steel Statistical Bulletin, Trade & Navigation Accounts


INTEREST RATES
%
6½
6
5½
5
4½
4
3½
3
2½
2
1½
1
½
YIELD ON CONSOLS
BANK RATE
TREASURY BILL RATE
1924
1930
1935
1940
1945
1950

BANK DEPOSITS

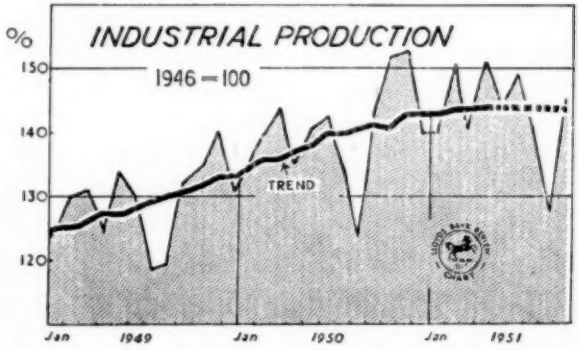


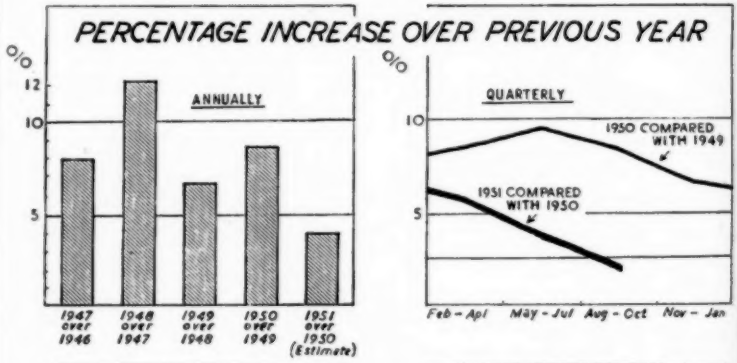


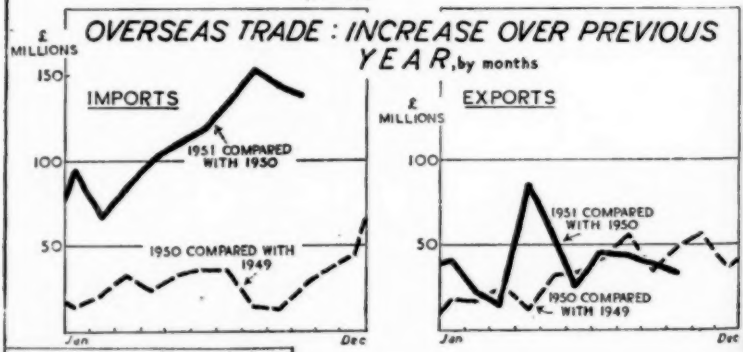


SOURCES: Monthly Digest of Statistics
Economic Journal, March, 1948

PRODUCTION & TRADE

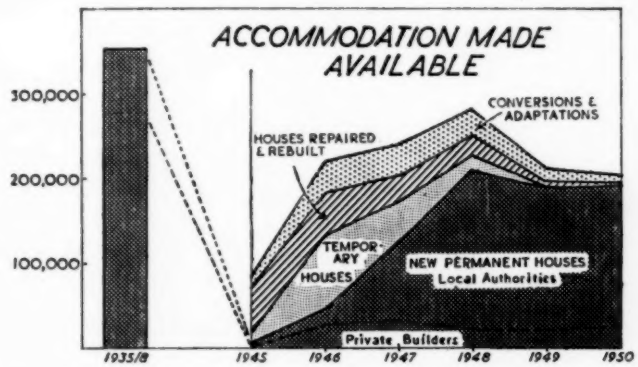


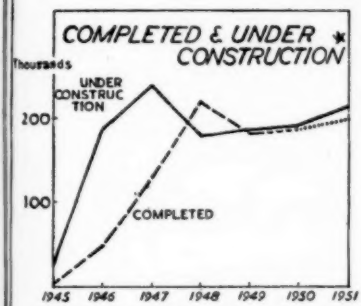


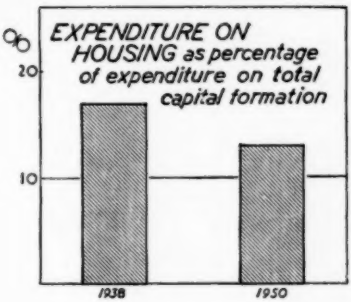


SOURCES: Monthly Digest of Statistics
Economic Survey for 1951

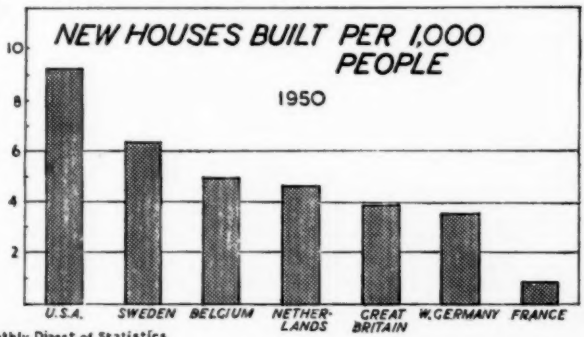
HOUSING



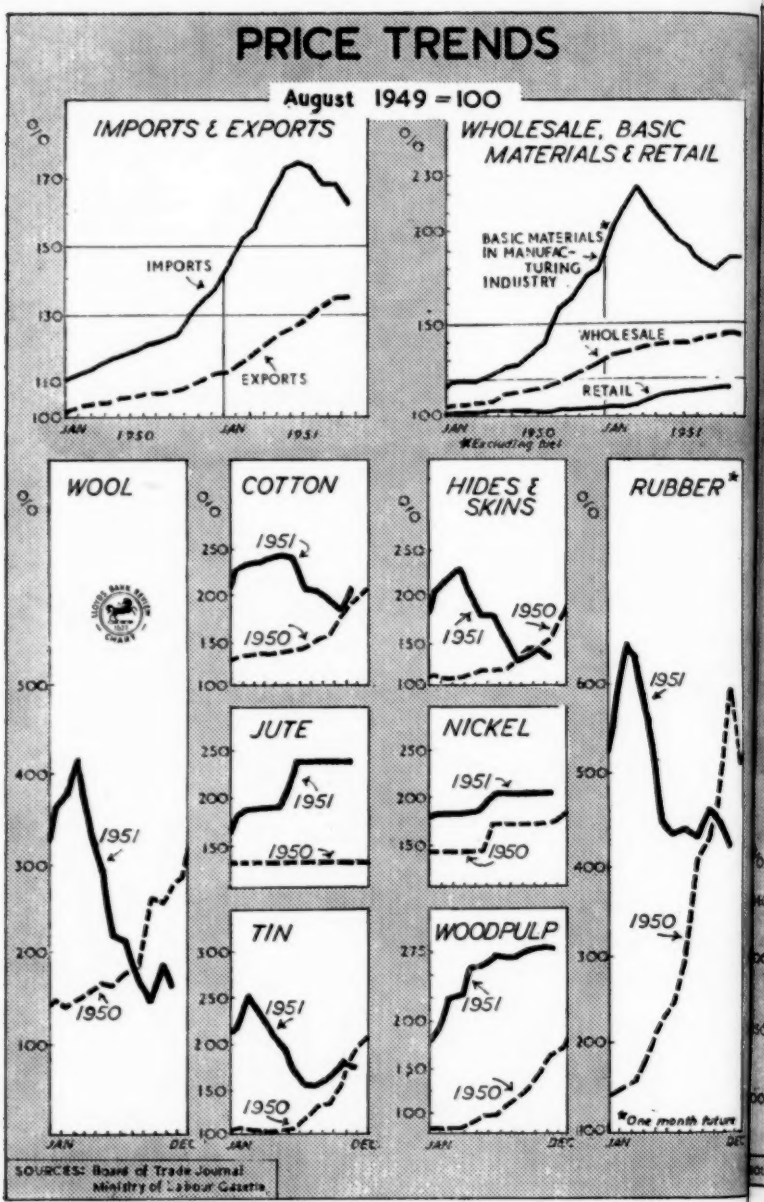




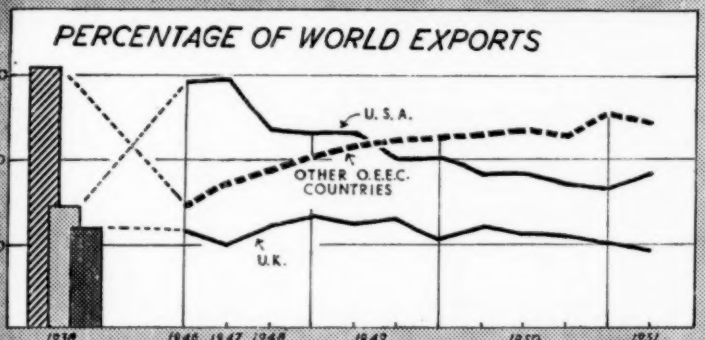
* Number of houses completed each year and number under construction at end of year, 1951 figure for houses under construction is at Sept 30.

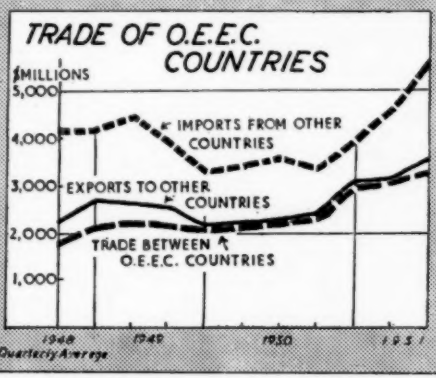


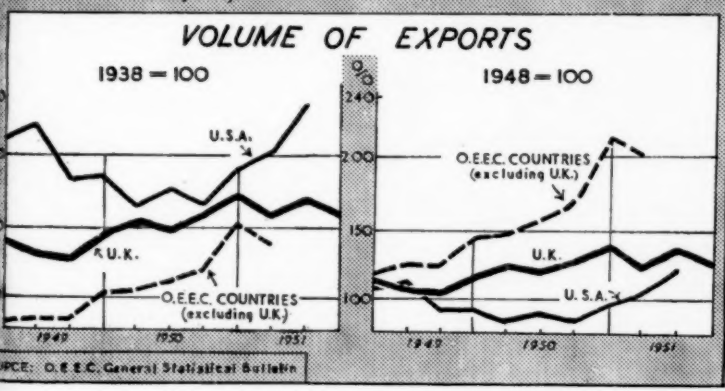
SOURCES: Monthly Digest of Statistics
U.N. Bulletin of Statistics


PRICE TRENDS
August 1949 = 100
IMPORTS & EXPORTS
IMPORTS
EXPORTS
WHOLESALE, BASIC MATERIALS & RETAIL
BASIC MATERIALS IN MANUFACTURING INDUSTRY
WHOLESALE
RETAIL
*Excluding fuel
WOOL
COTTON
1951
1950
HIDES & SKINS
RUBBER*
JUTE
NICKEL
TIN
WOODPULP
*One month future
JAN
DEC
SOURCES: Board of Trade Journal
Ministry of Labour Gazette

WORLD TRADE

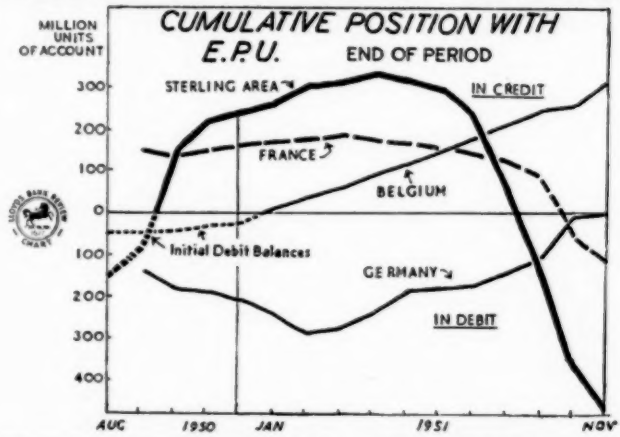


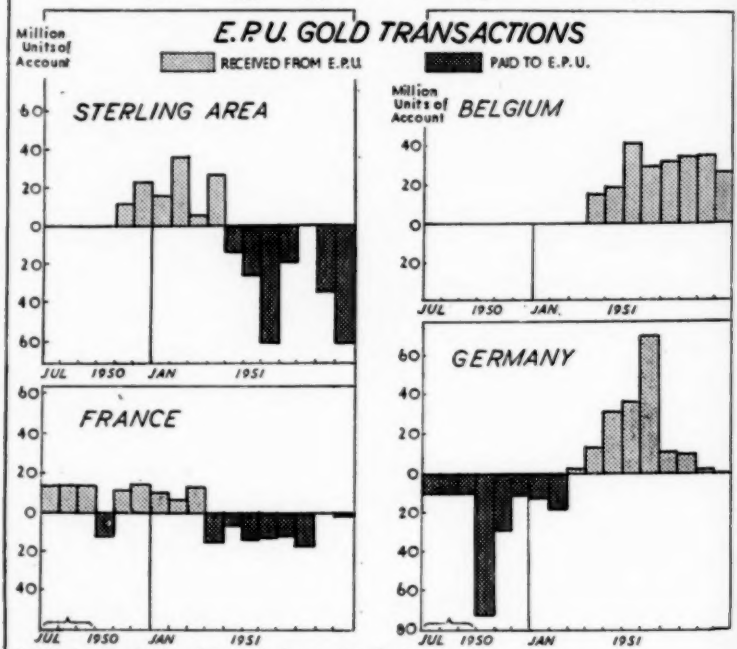




SOURCE: O.E.E.C. General Statistical Bulletin

EUROPEAN PAYMENTS UNION





NOTE: 1 unit of account is equivalent to U.S. $1.00
SOURCE: Treasury.